

5th Anniversary



ESCAIDE



ABSTRACT **BOOK**

European Scientific Conference on
Applied Infectious Disease Epidemiology

WATERFRONT CONGRESS CENTRE
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The conference is sponsored by ECDC (European Centre for Disease Prevention and Control) and jointly organised by ECDC, EPIET (European Programme for Intervention Epidemiology), EAN (EPIET Alumni Network), TEPHINET EUROPE (Training Programs in Epidemiology and Public Health Interventions NETWORK)

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FOREWORD

I would like to warmly welcome all delegates to the 5th ESCAIDE conference in Stockholm, the home of ECDC.

We have again received a record number of abstracts to the conference this year. Hence the peer review process to select abstracts continues to increase in its rigour, which ultimately means that the scientific discussions, presentations and posters at the 2011 ESCAIDE are of increasingly high quality. I would like to offer sincere thanks to all authors who submitted an abstract to the conference and to all the colleagues who kindly assisted in carrying out over 1000 peer reviews to assess the submitted work. Finally, I offer congratulations to those authors that have been chosen to present at ESCAIDE 2011; myself and my colleagues in the Scientific Committee are greatly looking forward to learning more of the methodology and application of epidemiology, microbiology and other related disciplines that you will present during the conference in support of communicable disease prevention and control.



Johan Giesecke

As with every ESCAIDE, we aim to prove a forum for information exchange and knowledge sharing, and hope that you will use the opportunity to discuss the current challenges you face in your daily work. ESCAIDE is also an opportunity to meet with old friends and colleagues. This is enjoyable, but also hugely valuable – in a global environment, the possibility to rely on European and Global networks of trusted colleagues in the event of a disease outbreak or emerging infection can make a significant difference to containment and control. Hence please renew acquaintances, and also take the opportunity to meet new colleagues – it is both personally rewarding and potentially of huge professional value to do so.

Another clear aim of ESCAIDE is to provide a platform for future public health experts from within the FETP (Field epidemiology training programme) and EPIET (European Programme for Intervention Epidemiology Training) programmes and EUPHEM (European Public Health Microbiology Training Programme) to present their work. We welcome all the fellows to the conference, and anticipate interesting presentations and discussions of your work.

The conference this year is being held at the newly open Waterfront conference centre in Stockholm; in keeping with the name of the venue, I hope that ESCAIDE will refresh your curiosity, quench your thirst for new knowledge, and ultimately leave you awash with new ideas and enthusiasm.

I wish you all an enjoyable, successful and stimulating conference.

Johan Giesecke
Chair, ESCAIDE Scientific Committee

SCIENTIFIC COMMITTEE



Johan Giesecke – ECDC, Chair of ESCAIDE Scientific Committee

Professor Johan Giesecke is Chief Scientist at the ECDC since 2005 and heads the disease programmes of the Centre in the Office of the Chief Scientist. From a background as infectious disease clinician, his research interests include: epidemic modeling, HIV/STIs and late sequelae of acute infections. He has published some 150 scientific papers, has written a textbook on infectious disease epidemiology and co-edited another.



Pierluigi Lopalco – ECDC

Pierluigi is a Medical doctor, and specialist in Hygiene and Preventive Medicine. Since 2005 Pierluigi has been working at the ECDC, where he heads the Centre's Programme on Vaccine Preventable Diseases. His primary field of interest is the epidemiological evaluation of vaccines and vaccination programmes. He is co-author of about 100 papers and co-author or contributor of several text books on the topic.



Brigitte Helynck – Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET) representative

Brigitte is a Medical Doctor, and worked for 12 years in Africa (with NGOs and for the French Ministry of Cooperation). She joined the French Public Health Service in 1996, and since 2000 has been working at the French Institute for Public Health Surveillance (InVS). Brigitte started the French Field Epidemiology Training Programme in 2002, and worked as an EPIET scientific coordinator in 2007–2010. Brigitte is currently in charge of training in the Scientific Department.



Arnold Bosman – ECDC

Arnold is a Public Health Specialist, trained in the Netherlands, focused on providing specialised training in Intervention Epidemiology to public health professionals. He is a member of the EPIET Scientific Conference committee. Currently he is a manager of Public Health Training at ECDC aiming to establish an effective network of training in applied public health (e.g. epidemiology, public health microbiology) in order to strengthen disease prevention & control capacity in EU.



Lorenzo Pezzoli – President of the EPIET Alumni Network (EAN)

Lorenzo holds a Degree in Veterinary Medicine and a PhD from the University of Turin. Between 2006 and 2008, as an EPIET Fellow (Cohort 12), he was based at the Health Protection Agency Centre for Infections in London. He currently works as an epidemiology consultant for different international organizations in the area of monitoring and evaluation of vaccination activities mainly in low- and middle-income countries. Since 2009 Lorenzo has been the President of the EPIET Alumni Network (EAN), one of institutions co-organizing ESCAIDE and the EPIET Seminar before that.



Aftab Jasir – ECDC/EUPHEM

Aftab is an associate professor, expert microbiologist and chief scientific coordinator of European Public Health Microbiology training program (EUPHEM) at ECDC. Aftab has worked in many public health bodies/organisations (Lund University hospital, Sweden; Health Protection Agency, UK; German Streptococcal Reference Laboratory, Aachen; and CDC, US). Specialisations include monitoring and evaluating QA/QC systems, molecular typing and subtyping, and developing molecular methods for characterisation of bacteria. Aftab is a member of many scientific societies and international advisory boards.



Andrea Ammon – ECDC

Andrea Ammon, MD, MPH is the Deputy to the Director and Head of Resource Management and Coordination Unit at the ECDC. Prior to joining the ECDC, Dr Ammon served in several roles at the Robert Koch-Institute, in Berlin, Germany, most recently as Head of Department for Infectious Disease Epidemiology. She has published over 90 peer-reviewed journal articles related to her work.



Mária Avdičová – ECDC Advisory Forum representative

Maria is a senior epidemiologist and the Head of Epidemiology Department in the Regional Public Health Authority Banska Bystrica, Slovakia. Her department and her team are responsible for the Surveillance and monitoring of communicable diseases in the Slovak Republic. She is a vice president of Slovak Epidemiological and Vaccinological Society. Since 2006 she is a member of ECDC's Advisory Forum.



Ines Steffens – ECDC

Ines is the Editor-in-Chief of Eurosurveillance journal. Ines joined ECDC in 2006 as Managing Editor for Eurosurveillance, and between 2007–2011 set up ECDC's Scientific Communication Section. Before joining ECDC, Ines was Editor-in-Chief for Germany's national epidemiological and public health bulletin, the *Epidemiologisches Bulletin* at Robert Koch Institute, Berlin, Germany. Ines is a trained internist, with broad clinical experience and expertise in infectious diseases. She holds a master degree in public health, and has a special interest in communication-related issues.



Panayotis T. Tassios – European Society of Clinical Microbiology and Infectious Diseases

P. T. Tassios is Assistant Professor in Molecular Microbiology at the National & Kapodistrian University of Athens, Greece. His research focuses on the molecular typing of bacterial strains and their antimicrobial drug resistance mechanisms, to assist epidemiological investigations and infection control. He is also active in lifelong teaching, on his scientific interests as well as on scientific writing, aided by his experience as Associate Editor of several journals.



Howard Needham – ECDC

Howard is the Scientific Liaison Officer at the ECDC. Since 2008, Howard has been coordinator of the ESCAIDE conference and scientific programme under the ESCAIDE Scientific Committee. Howard has a background in biological sciences and has held policy roles in the UK Government and the European Commission in animal health issues and zoonoses, including notably transmissible spongiform encephalopathies and avian influenza. Howard joined the ECDC as the influenza programme coordinator in 2006, and took up his current position in 2008.



Viviane Bremer – ECDC/EPIET

Viviane trained as medical doctor, before working in nephrology research in Japan and the German Federal Drug Agency. Viviane holds a master degree in public health and completed the German FETP (now called PAE) at the Robert Koch-Institut in 2001. After that, she worked as a field epidemiologist, with a focus on STI surveillance and research for six years. Viviane supervised EPIET fellows and was a coordinator of the German FETP before becoming EPIET coordinator in 2004. In this function, she co-organised the EPIET Scientific Seminar, which preceded ESCAIDE. Viviane joined ECDC in 2008 as the EPIET Chief Coordinator.

ABSTRACT REVIEWERS

- 1 **Barbara Schimmer** (The Netherlands)
- 2 **Prof. Dr. med. Andrej M. Grijbovski** (Norway)
- 3 **Andreas Sandgren** (Sweden)
- 4 **Andreas Jansen**; M. D. (Sweden)
- 5 **Dr. Derval Igoe** (Ireland)
- 6 **Camilla Croneld**; TAS (Sweden)
- 7 **Prof. Anna Doboszynsk** (Poland)
- 8 **Anna-Pelagia Magiorakos**; M. D. (Sweden)
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- 10 **Dr. Andrea Gervelmeyer** (Italy)
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- 149 **Jozef Dlhý**; M. D., Ph. D. (Czech Republic)

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PLENARY SESSION **ABSTRACTS**



PLENARY SESSIONS ABSTRACTS

PLENARY SESSION A

Keynote Address

Control of infectious diseases in complex emergency situations

Dr. Marie-Pierre Allié

AFFILIATIONS

Médecins Sans Frontières, 8 rue Saint-Sabin, 75011 Paris

ABSTRACT

Complex emergencies refer to relatively acute situations, involving a combination of conflict with displacements of people, food shortage, and fragile or failing economic, political, and social institutions, which can be exacerbated by natural disasters. They result in significant excess mortality, due not only to trauma, but also to increased risk of malnutrition or communicable diseases.

If most of these deaths are avoidable, control of infectious diseases in such circumstances presents several challenges ranging from the faculty to alert on occurrence of an abnormal event at an early stage to the ability to deploy preventive and curative measures in the most effective way.

Health interventions during these major crises should be based on objective epidemiological data. However, absence of reliable surveillance system and poor quality of data are most often obstacles to early warning, as well as comprehensive understanding of situation. Analysis and use of data have to be done in a context of scarce and fragmented information. Therefore, systems put in place need to provide simple, flexible, reliable and useful information.

Where noticeable progress have been made in control of communicable diseases in camp settings, the delivery of public health interventions in emergencies affecting large geographical areas is rendered complex by insecurity, political turmoil, precarious living conditions of the population, and lack of medical infrastructures and trained staff. In complex emergency, getting access to population in order to carry appropriate intervention is always the result of a negotiation process where the sensible use of relevant epidemiological data will be essential.

Keywords:

PLENARY SESSION B

“Parasitic infections of increasing relevance for Europe”

Climate and global change effects on Zoonotic Parasitic Diseases

Prof. Dr. Honoris Causa Santiago Mas-Coma

AFFILIATION

Departamento de Parasitología, Facultad de Farmacia, Universidad de Valencia, Av. Vicent Andres Estelles s/n, 46100 Burjassot, Valencia, Spain

ABSTRACT

Parasites (protozoans and helminths) are organisms with less short generation times and less rapid population growth rates than viruses and bacteria. This explains why the emergence of parasitoses, mainly helminthiases, takes more time to be detected and imply more control difficulties. Additionally, monoxenous parasites (one-host life-cycle parasites) are not those presenting bigger health control problems within this context. Zoonotic parasitoses and, among them, those having less definitive host specificity and transmitted by a non-strictly specific vector (or intermediate host) show higher introduction, spreading and emergence capacities.

Climate and global changes represent potential risks for several zoonotic parasitoses in Europe. Several diseases illustrate good examples. In leishmaniasis, intra-European transport of domestic dogs (reservoir) with northern tourists visiting southern countries and a global warming inducing a northward spread of phlebotomine vectors imply a possible northward spread from its original south-European distribution. Similar arguments may be highlighted for dirofilariasis, a mosquito-borne disease also using dogs as reservoirs, which is showing an evident increase of human cases in Europe. Recent human fascioliasis outbreaks in France were related to the unexpected contamination of commercially grown watercress in its turn due to the adaptation of the parasite to the nutria, a sylvatic rodent recently introduced from South America.

The emergence of Chagas disease in Europe is a completely different situation. Thousands of patients have been diagnosed among Latin American immigrants, mainly in Spain but also in France, Portugal, Switzerland and Italy. This disease cannot be established in Europe due to the absence of the triatomine vectors, but its pathogenic sequelae, mother transmission to newborns, and direct transmission capacity through infected blood donors illustrate large health problematics Europe never expected to face.

Keywords: Zoonotic parasitoses, climate and global changes, Europe

PLENARY SESSION B
**“Parasitic infections of increasing relevance
 for Europe”**

Emergence of food-borne parasitic diseases

Prof. Dr. Pierre Dorny

AFFILIATIONS:

Institute of Tropical Medicine, Antwerp, Belgium
 Faculty of Veterinary Medicine, Ghent University, Belgium

ABSTRACT

Foodborne infections are mostly associated with bacteria but meat, fish and vegetables can also be the source of parasitic infections of which some may have high medical or economic impacts. Globalization of the food supply, increased international travel, increase of the population of highly susceptible persons, change in culinary habits, are some factors associated with the increased diagnosis of food-borne parasitic diseases. These include, waterborne parasites transmitted by contaminated food such as *Cyclospora cayentanensis*, *Cryptosporidium* and *Giardia*, parasites that may be transmitted through faecal contamination of foods, such as *Toxoplasma gondii* and *Echinococcus* spp., meat-borne parasite infections that may be acquired by eating raw or undercooked meat infected with cyst stages of parasites, such as *Taenia* spp, *Trichinella*, *T. gondii* and *Sarcocystis*, and finally fish-borne parasites, such as *Anisakis* and *Opisthorchis*. Meat inspection is the principal method applied in the control of *Taenia* spp. and *Trichinella* spp. However, it is often not very sensitive, frequently not practised, and not done for *T. gondii* and *Sarcocystis* spp. Because of inadequate systems for routine diagnosis and monitoring or reporting for many of the zoonotic parasites, the incidence of human disease and parasite occurrence in food is underestimated. Of particular concern in industrialised countries are the highly resistant waterborne protozoal infections as well as the increased travel and immigration, which increase the exposure to exotic diseases.

Keywords: Parasites, Foodborne diseases, zoonoses, emerging diseases

PLENARY SESSION B
**“Parasitic infections of increasing relevance
 for Europe”**

Endemic parasitic diseases in Europe: Recent trends in echinococcosis and other cestode infections.

Dr. Thomas Roming

AFFILIATION

Universität Hohenheim, Stuttgart, Germany

ABSTRACT

Of all human infections caused by cestodes, cystic and alveolar echinococcosis have the most serious impact on public health in Europe. Cystic echinococcosis (CE) is a zoonotic disease whose treatment usually requires surgery in combination with drug therapy. It is mainly transmitted in a dog-livestock cycle, accidentally infecting humans. Due to supervised slaughtering, it has declined or disappeared in large parts of Europe, but remains important in several Mediterranean countries and parts of eastern Europe. It is now recognized that CE is caused by several different agents, formerly all hidden under the name *Echinococcus granulosus*. This diversity has consequences for prevention and control. In contrast, *E. multilocularis*, causing alveolar echinococcosis (AE), is essentially a parasite of wildlife (fox-rodent cycle). AE is a severe malignant disease which is difficult and expensive to treat and control. During the 1990s, a sharp increase of the parasite's frequency in animals and an apparent drastic range extension has occurred, followed by an increase in the number of human cases at least in parts of central Europe. New regions of high endemicity have emerged (Tatra, Baltic states), and recently the parasite has established itself in previously non-endemic areas (Sweden). Large peri-urban fox populations have led to an increasing exposure to AE in urban areas. Cysticercosis caused by *Taenia solium* infection has become extremely rare in Europe due to slaughterhouse surveillance and high sanitary standards. The food-borne intestinal infections with adult cestodes (taeniosis, diphyllbothriosis) rarely cause severe disease and are uncomplicated to treat. Diphyllbothriosis, however, although declining in the previously high endemic regions (Baltic states, Fennoscandia), seems to be on the increase in southern central Europe, which calls for better surveillance.

Keywords: Echinococcosis, cysticercosis, taeniasis, diphyllbothriosis, zoonosis, epidemiology

PLENARY SESSIONS ABSTRACTS

PLENARY SESSION B

“Parasitic infections of increasing relevance for Europe”

Present capacities and expertise on parasitic diseases in Europe

Prof. Dr. Jean Dupouy-Camet (1) & Edoardo Pozio (2)

AFFILIATIONS

1. Parasitology Dpt, Cochin Hospital, Paris Descartes University, Paris, France
2. European Union Reference Laboratory for Parasites, Istituto Superiore di Sanità, Rome, Italy

ABSTRACT

Several networks of parasitologists involving scientists, biologists, vets and physicians exist in Europe (Dupouy-Camet et al. Trends Parasitol. 2009;25:293-5). European research in Parasitology has a very high impact all over the world as highlighted by a recent analysis of publications on the topic by Lab Times (2009). In Europe, parasitic diseases have emerged, are emerging or will emerge because of the increase of international travels, modification of food or sexual habits, immunosuppression, social upheavals, climate changes. In Europe, national institutions and parasitologist's networks of are able to cope with these problems. In most countries of the EU, national reference labs have collaborative actions coordinated by the European Union Reference Laboratory for Parasites (EURLP). Each institution is reporting yearly data on some selected zoonotic parasitic diseases (e.g., trichinellosis, toxoplasmosis, echinococcosis, cysticercosis) to the ECDC and EFSA to constitute the Community Summary Report on Zoonoses. Non-profit organisations such as the European federation of parasitologists (EFP) and at a lesser extent the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) are also contributing to promote and to support the exchange of knowledge and coordination of researches on parasites and parasitic diseases. In addition, the EFP organizes the European Multicolloquium of Parasitology (EMOP) every 4 years where parasitologists exchange their experience on the diagnosis, treatment and prevention of parasite-related diseases. In some occurrences, outbreaks sharing a common source can have an European extent (e.g., trichinellosis, opisthorchiasis) and therefore alerts (e.g., official channels, quick electronic publication by Eurosurveillance) are of utmost importance. The results of a survey carried out by the EFP and the EURLP to evaluate the surveillance of some selected parasitosis will be presented during the ESCAIDE meeting.

Keywords: Europe, networks, parasitology, parasites, surveillance, zoonose

PLENARY SESSION C

The Hospital as an infectious disease amplifier

The era of multiresistant Gram-negative infections: From genomics to prevention

Dr. Vivi Miriagou

AFFILIATION

Hellenic Pasteur Institute, Athens, Greece)

ABSTRACT

Although containment of infections is a permanent task of health-care (HC) institutions, we are currently witnessing a crisis of global dimensions due to the spread of multi- and pan-drug-resistant (MDR) Gram-negative bacteria (GNs). This presents an epidemiological picture unprecedented for these organisms and suggests that control policies need to be revised. The growing prevalence of HC-associated infections by MDR-GNs also seriously limits treatment options. The ongoing “enrichment” of clinical flora by MDR-GNs such as pseudomonads, acinetobacters and enterobacteria, can be viewed as a multi-factorial phenomenon, involving the changing spectrum of infected individuals, the intensive use of antimicrobial agents, and the biology of resistance.

The biological and evolutionary mechanisms governing the emergence, establishment and dissemination of resistance in GNs will be presented. The main epidemiological aspects, clinical impact, and problems in controlling dissemination of these HC-associated infections will be discussed.

Keywords:

PLENARY SESSION C

The Hospital as an infectious disease amplifier

Gram-positive bacteria and their resistance to drugs: biology, epidemiology, infection control and prevention

Dr. Alexander W. Friedrich

AFFILIATION

Dept. Medical Microbiology, University Hospital Groningen, Groningen, The Netherlands

ABSTRACT

In an ageing society, healthcare-associated infections (HAI) due to facultative pathogenic bacteria become an emerging infectious disease problem and a challenge to infection control. Gram-positive bacteria continue to be one of the most important causes for community- and hospital acquired infections. Especially, *S. aureus* and its Methicillin- and therefore mostly multi-resistant form MRSA, Glycopeptide-resistant *Enterococcus faecium* (GRE) and *Clostridium difficile* belong to this group of facultative pathogenic bacteria causing healthcare-associated infections.

In the late 90's e.g. differences of prevalence of MRSA in blood cultures (MRSAB) between European countries were firstly identified by national surveillance and benchmarking. Especially, differences in antibiotic use and infection control (e.g. screening, search & destroy, antibiotic stewardship) were meant to be the most important success factors. Today, MRSAB has been reduced in countries with former high endemicity and it is rising in other countries that were considered to have low MRSA-rates. Major infection control and antibiotic stewardship efforts that have been initiated are an important factor for success, on the other side it is important to understand that different MRSA seem to be responsible for the visible changes of MRSAB epidemiology in Europe.

Today, due to large molecular epidemiological networks and modern microbiological methods we have learned new insights into the transmission dynamics, the molecular epidemiology and the virulence mosaic of *S. aureus*. These methods give on the one side information about relatedness and transmission (epi-typing), on the other side on virulence and pathogenic power (patho-typing). Consequently, it is known today that MRSA is not the same than MRSA. 3 major groups have been described, i.) hospital-acquired (ha)MRSA, ii.) community-acquired (ca)MRSA and iii.) livestock-associated (la)MRSA. Furthermore, virulence determinants (e.g. PVL) are distributed unequally over the several clonal lineages, giving one explanation for less virulence of some MRSA subtypes. In a large molecular epidemiological study it has been shown that la(MRSA) are –at the moment- only rarely found in invasive *S. aureus* disease in Europe. On the other side, data shows that not only microbiological factors contribute to the fact that (la)MRSA are less frequently associated with disease, but rather missing predisposing risk factors in the patient group that is typical (la) MRSA carrier. In the Netherlands and the Dutch-German border region the prevalence of (la)MRSA among all human MRSA carriers is between 20% and 50%. Furthermore, the example of (la) MRSA makes it clear that a search & destroy policy will have no benefit if the carriers continue to be exposed. Studies on the transmission dynamics bring further into the focus that not only transmission between patients, but especially transmission of patients between healthcare institutions who are carriers of MRSA are responsible for the continuous spreading of MRSA in a healthcare cluster.

Looking at these influencing factors, it becomes clear that any preventive intervention must therefore be adapted to the prevalence of the respective microorganism, the predominant subtype and to the transmission-complexity of the healthcare cluster in a given region or country. Therefore, molecular, microbiological and epidemiological data need to be analyzed locally and nationally on a real-time basis in order to make a risk assessment and to fully understand today's epidemiology of HAI. This can lead to a crossborder network for preventive microbiology with the goal to foster patient safety and infection protection in Europe.

Keywords:

PLENARY SESSIONS ABSTRACTS

PLENARY SESSION D

Enhancing health and health equality through vaccination programmes

Economic and societal value of vaccination

Prof. Andrew Farlow

AFFILIATION

Department of Zoology and Department of Economics, University of Oxford

ABSTRACT

It is often said that vaccination is the most 'cost effective' health intervention possible for developing countries. This assertion hides much essential nuance. Many of the 'easy vaccines' have already been developed. Many of the vaccines currently being pursued – such as for HIV, TB, malaria, and dengue – still require a great deal of basic scientific knowledge and have large development and delivery costs still to come. Impact with many recently-developed and future vaccines will require much more than a product; they will need a strategy for delivery and evidence on what the most appropriate pattern of usage is. For example, it is clear that any 'first-generation' malaria vaccine will fall short of the ideal, evolution will weaken efficacy over time, and there are interventions besides a vaccine that will require continued emphasis. Early indications are that a new (and the first) dengue vaccine may need delivery outside of the EPI and booster shots, will need to work alongside other control interventions, and may generate tensions between the better off and the poor. Roll-out of new vaccines will raise ethical, political and economic issues, including for European policymakers within this broader global context.

In January 2010 the Bill and Melinda Gates Foundation launched a 'Decade of Vaccines', committed \$10bn over 10 years to help research, develop and deliver vaccines for the world's poorest countries, and called on governments around the world to step up their levels of funding into this activity too. The GAVI Alliance has set itself ambitious targets, from the more complete roll-out of its vaccine programs to the delivery of a range of new vaccines. Yet, much of the long-term funding still remains fragile and inadequate, and prioritization is becoming increasingly important. Now, more than ever, it is important to develop a more nuanced interpretation of the economic and societal value of different vaccines.

Keywords:

PLENARY SESSION D

Enhancing health and health equality through vaccination programmes

Economic evaluation in the decision making process regarding introduction of new vaccines in Europe

Dr. Daniel Lévy-Bruhl

AFFILIATION

National Institute for Public Health Surveillance (InVS), France

ABSTRACT

The decision of introduction of a new vaccine in the immunisation schedule is a complex and multidisciplinary process based on the assessment of the risk-benefit balance and, increasingly, on the assessment of the cost-effectiveness ratio of the vaccination. Cost-effectiveness studies compare the incremental costs of the vaccination program with the generated health benefits. Those assessments rely most often on mathematical models allowing including the indirect effects of a mass vaccination on the epidemiology of the target disease and taking into account the uncertainty surrounding both epidemiological and economical parameters. In 2006 and 2007, two vaccines against rotavirus (RV) infections and two vaccines against human papillomavirus (HPV) infections were granted licensing authorisations by the European Medicines Agency (EMA). Since then, Member States (MS) have been facing the decision about introducing or not these vaccinations into their national immunisation schedule. For none of those vaccinations, the decision was straightforward: in most MS, the burden of deaths attributable to RV infection is very low and for HPV, the added value of vaccination above the precancerous screening strategy based on Pap smears was questionable. Economical evaluations performed in many MS have been instrumental in the final decision. However, the studies conducted in MS lead to discrepant conclusions regarding the cost-effectiveness of routine infant RV immunisation. Several factors contributed to this heterogeneity, such as differences in burden of disease, healthcare seeking behaviours or health care delivery systems, in vaccines or other costs estimates and in the methodologies used for the economical analysis. Regarding HPV vaccination, more consensual conclusions were reached regarding the cost-effectiveness of pre-adolescents vaccination.

Keywords:

PLENARY SESSION D

Enhancing health and health equality through vaccination programmes

Social determinants impacting on vaccine uptake

Dr. Anette Siedler

AFFILIATION

Robert Koch Institute, Germany

ABSTRACT

In 2009, a total of 23.2 million infants worldwide were not immunised against Diphtheria, Tetanus and Polio (WHO). Most of them live in low income countries in South East Asia (9.8 mio) or Africa (8.3 mio). Although a remarkable reduction in childhood deaths due to vaccine preventable diseases has been achieved in these regions in recent years, much effort is still necessary to reach the underserved. Apart from financial support for national immunisation programmes, public trust into vaccines and vaccine safety are also issues which have to be addressed when implementing immunisation programmes in low and middle income countries.

In industrialised countries vaccine uptake is also not sufficient for many vaccines, although availability of vaccines is high. Difficult access to health care is one of multiple reasons for not being vaccinated. Other mainly socially determined factors influencing vaccination are migration background, family size, socio-economic status including education, together with religious beliefs and perceptions on efficacy and safety of vaccines. Interestingly, vaccine uptake is often better in middle-class people, in comparison to those from lower or higher social status. Gaps in parental knowledge and insufficient information on the benefits of vaccination belong to the main reasons for sceptic attitudes towards vaccination, particularly as the threats of the diseases have often vanished due to long lasting successful immunisation activities.

Complacency, hesitancy to and even refusal of vaccines and vaccinations are of increasing concern worldwide. Therefore, policy makers together with public health specialists and other stakeholders should consider social determinants of vaccine uptake in immunisation programmes if they want to reach all those who are unvaccinated or under immunised.

PLENARY SESSIONS SPEAKERS

Keynote plenary address: Infectious disease control in complex emergency situations



Dr. Marie-Pierre Allié, MD, MPH is the current president of Doctors Without Borders/Médecins Sans Frontières (MSF) in France. She joined MSF in 1990. She worked in Sudan, South Africa, Cambodia, and Iran with the organization before joining the Paris office from 1996–2001 to oversee programs in East, Central and West Africa, Asia, and Pacific region.

Dr. Allie went on to work as a public health physician in France from 2001 to 2007, before rejoining MSF as Director of Operations. She is currently the President of the French section of MSF since 2008. Dr Marie-Pierre Allie holds a diploma in tropical medicine from the Institute of Tropical Medicine in Anvers (Belgium) and a Master of Public Health from the London School of Hygiene and Tropical medicine.

Plenary Session B – Parasitic infections of increasing relevance for Europe



Prof. Dr. Honoris Causa Santiago Mas-Coma is the Director of the Parasitology Unit and of the WHO Collaborating Centre on Fascioliasis and its Snail Vectors in the University of Valencia, Spain. His present positions include President of the European Federation of Parasitologists (EFP) since 2004, Treasurer of the International Federation of Tropical Medicine (IFTM) since 2008, Member of the Executive Board of the World Federation of Parasitologists (WFP) since 2006, and Past-President of the Spanish Society of Parasitology (SEP) since 2007.

He has been the director or leader of very numerous research projects developed throughout the world and has published over 330 scientific papers on epidemiology, ecology, transmission, evolution, molecular biology, genetics and control of many parasitic disease agents, including mainly helminths and mollusc and arthropod vectors of infectious diseases. His principal research interests at present are food-borne trematodiasis, among which mainly fascioliasis and its lymnaeid snail vectors worldwide, and triatomine insects transmitting Chagas disease in Latin America, and anopheline mosquitoes related to malaria transmission.

He holds advisory and consultancy posts in national and international agencies as WHO (a member of the Scientific and Technical Advisory Group – STAG – of WHO on neglected tropical diseases), IAEA and FAO, as well as in editorial boards of a number of journals. He has received many national and international honours, prizes and awards, including the title of Doctor Honoris Causa for his efforts against parasitic diseases in developing countries.



Prof. Dr. Jean Dupouy-Camet is Professor of Medical Parasitology in Paris Descartes University. He is head of the department of Parasitology-Mycology of Cochin Hospital, Assistance Publique-Hôpitaux de Paris (France) and head of the National Reference Center for Trichinella. He holds a MD in general practice, a specialization in Tropical medicine and a PhD in Parasitology, all obtained in Paris University. He is past president of the International Commission on Trichinellosis, past general secretary of the French Society of Parasitology and Vice president of the European federation of Parasitologists (EFP).

Prof. Dr. Pierre Dorny holds a DVM (1980) and PhD (1990) degree from Ghent University, Belgium and has followed a postgraduate course (1981) in tropical animal health and husbandry at ITM, Antwerp. He is diplomate of the European Veterinary Parasitology College (EVPC) since 2003.



After working one year in private practice, he joined the faculty of Veterinary Medicine, UGent from 1983–1990 where he worked as a research assistant in the laboratory of Parasitology. His PhD research was on diagnosis and control of gastrointestinal nematodes on dairy cattle farms. From 1990–93 he worked as a parasitologist in a university collaboration research project in Malaysia on control of nematodes in small ruminants. In 1994 he worked as parasitology consultant in a USAID project on sheep production in Sumatra, Indonesia. From the end of 1994 he joined both the ITM and UGent to continue research on animal parasites. In 2000 he was appointed as a lecturer in veterinary helminthology at the ITM and as guest professor (20%) of tropical veterinary medicine at the UGent. He became chairman of the Department of Animal Health, ITM in 2003. He was appointed full professor at ITM in 2008.

Besides his teaching assignments in veterinary helminthology and tropical veterinary medicine at ITM and UGent, he is head of a laboratory that conducts research on helminth zoonoses and helminth control in which several post-doc and PhD students work. The laboratory is National Reference Centre for diagnosis of trichinellosis and other parasite zoonoses. He is (co-)author of over 170 peer-reviewed papers in international journals.

Dr. Thomas Roving graduated as a Biologist at the University of Hohenheim in Stuttgart, Germany and since 1982 has been working in the field of cestode zoonoses. He worked in Kenya with the African Medical and Research Foundation (AMREF) to prevent and control cystic echinococcosis. Later, he led a research project on the applicability of anthelmintic baiting of wild foxes against *Echinococcus multilocularis* infection in southern Germany. He was subcoordinator for the European Registry of Alveolar Echinococcosis (EurEchinorReg), and co-coordinated the EU project EchinoRisk on the epidemiology of alveolar echinococcosis (2001–2005). He was external advisor for a project on experimental control of *Echinococcus multilocularis* by the Hokkaido Institute of Public Health (Japan). Currently, he is Co-PI of an ongoing DFG funded programme on the molecular epidemiology of cystic echinococcosis in sub-Saharan Africa (since 2009). He is a member of the WHO Informal Working Groups on Echinococcosis and one of the editors of the forthcoming WHO guidelines on control of echinococcosis. He served as scientific advisor of the government of Baden-Württemberg (Germany) on control of alveolar echinococcosis, as expert for EFSA and as temporary adviser of WHO on control of echinococcosis.



PLENARY SESSIONS SPEAKERS

Plenary Session C – The Hospital as an infectious disease amplifier



Dr. Vivi Miriagou is currently senior researcher in the Laboratory of Bacteriology, Hellenic Pasteur Institute. She has received her PhD in Microbiology in 1997 from the Aristotelian University of Thessaloniki. In 2001 she joined the Laboratory of Bacteriology of the Hellenic Pasteur Institute and, since 2006, she has been appointed researcher in the same laboratory. She participates in the research projects of the laboratory on Bacterial Antibiotic Resistance and is responsible for the activities on the genetics of resistance to newer β -lactams. Her main research interests are (a) the biochemical and molecular characterization of determinants encoding for beta-lactamases, enzymes that hydrolyze the beta-lactam antibiotics, (b) the delineation of the enzymatic mechanism of hydrolysis of beta-lactam antibiotics by beta-lactamases, (c) the investigation of the expression, mobilization and clustering of resistance determinants, and (d) the characterization of genetic units, such as multi-resistant plasmids, carrying resistance genes. Also modelling of resistance enzymes and complexes with the respective antibiotics has been introduced in the laboratory under her supervision. She has 74 publications in peer-reviewed international journals (including 3 reviews and one editorial), she is currently on the Editorial Board of two international scientific journals, and since 2010 she is appointed to work with ECDC as Disease Expert – Laboratory for Greece, in the ECDC-Network for Antimicrobial Resistance-AMR.



Dr. Alexander W. Friedrich is Professor and Chair of Medical Microbiology, Head of Department of Medical Microbiology and Infection Prevention at the University Hospital Groningen, the Netherlands. Between 2006–2010 he was senior physician at the Institute of Hygiene, head of unit for infection control and hospital hygiene, physician responsible for the microbiological laboratories of the Institute of Hygiene.

His current EU/ECDC projects include; since 2005, Coordinator of the SeqNet.org initiative (www.seqnet.org) and curator of the spa server for the excellence in quality of sequence based typing of *S. Aureus*; since 2007, EU/Interreg IIIa – Coordinator of Dutch-German network for crossborder Prevention of MRSA (www.mrsa-net.eu); since 2009, EU/Interreg IVa – Leadpartner of the Dutch-German network for crossborder patient safety (www.eursafety.eu); since 2009, ECDC-tender – Coordinator on guidance of hospital and community MRSA in Europe; since 2010, ECDC tender – Cotenderer on typing of *S. aureus* in public health in Europe.



Dr. Bruno Coignard is Medical Epidemiologist specialised in the epidemiology of healthcare-associated infections (HAI) and antimicrobial resistance (AMR). He works at National public health surveillance institute in Paris. Since 2002 coordinates HAI and AMR early warning and surveillance activities at national level. He was trained as an Epidemic Intelligence Officer (EIS) and the Centre for Disease Control and Prevention (CDC), Hospital Infections Program (1999–2001).

His current areas of work include the development, implementation and assessment of HAI/AMR surveillance systems; early warning and HAI outbreak investigation; management of collaborative surveillance programs; linkage with institutional partners, scientific expertise in relevant national and European bodies. His recent activities include the consolidation and development of surveillance activities if InVS in the field of HAI and AMR, through the national Healthcare-Associated Infections Early Warning, Investigation and Surveillance Network (Raisin). He has been leading several HAI outbreak investigations in France.

Plenary Session D – Enhancing health and health equality through vaccination programmes

Dr. Daniel Lévy-Bruhl is a Medical Epidemiologist. After having worked as a free-lance consultant for UNICEF and WHO mainly for the Expanded Program on Immunisation and the Control of Diarrhoeal Diseases Program, he joined the Communicable Diseases and Immunisation Unit of the International Children Centre in Paris in 1986. His main activities consisted in training activities in epidemiology applied to vaccination, in conducting operational research and in providing expertise regarding vaccination programs to the Ministries of Health of developing countries. Since 1997, he joined the French National Institute for Public Health Surveillance where he is co-ordinating, within the Infectious Diseases Department, the Unit in charge of the activities related to the surveillance of vaccine preventable diseases. The main function of this unit is to monitor the epidemiological impact of the vaccination activities carried out through the National Immunisation Schedule.



Dr. Anette Siedler has PhD in economics and diploma in organisation of science. She is senior epidemiologist in Robert Koch-Institute (a Federal Institute within the portfolio of the Federal Ministry of Health); member of staff in the Immunization Unit of the Department of Infectious Disease Epidemiology.



Her main tasks: analysis of surveillance data on vaccine preventable diseases and evaluation of the impact of immunization programmes on disease epidemiology; organizing several sentinel surveillance systems in physicians' practices (i.e. measles, varicella) and laboratories (i.e. invasive pneumococcal disease); contributing to European networks on vaccine preventable diseases (EUVAC.NET) and invasive bacterial infections (IBI)

Prof. Andrew Farlow is Research Fellow in Economics, Oriel College and Department of Economics, University of Oxford, and Senior Research Fellow, Department of Zoology, University of Oxford. He is co-PI on Oxford's new Vaccine Design Institute, with responsibilities for a project on Vaccine Health Economics, and part of the Oxford partnership of the new International Research Consortium on Dengue Risk Assessment, Management and Surveillance (IDAMS). His research interests span the economics of pharmaceutical R&D; measurement of the socioeconomic impact of health interventions (drugs, vaccines, diagnostics, and vector control); global health funding; affordable innovation and technology transfer; application of financial and risk management tools to global health analysis; and market, pricing, launch, and delivery strategies, especially in resource-poor settings. He has advised a wide variety of public and private sector organizations including: WHO; Bill and Melinda Gates Foundation; UK Department for International Development; Aeras TB Vaccine Foundation; TB Alliance; Policy Cures; Médecins Sans Frontières; World Economic Forum; Dalberg, Global Development Advisors; Results for Development Institute; Global Alliance for Vaccines and Immunization; Office of Health Economics, London; UK Treasury; World Bank; Malaria Vaccine Initiative; the UK's Joint Committee on Vaccines and Immunizations, etc. He is a member of the Stop TB Partnership Working Group on New TB Vaccines: Task Force on Economics and Product Profiles (WHO, Bill and Melinda Gates Foundation, Aeras Global TB Vaccine Foundation). He teaches Vaccine Deployment and Policies for the Vaccinology module of the Oxford MSc in Global Health Science. He was educated at the Universities of Cambridge and Oxford.



PARALLEL SESSION **ABSTRACTS**

PARALLEL SESSION ABSTRACTS

ANTIMICROBIAL RESISTANCE/ HEALTH CARE ASSOCIATED INFECTION

Emergence of carbapenemase-producing Enterobacteriaceae in France, 2004 to 2011

Sophie Vaux (1), Anne Carbonne (2), Jean-Michel Thiolet (1), Vincent Jarlier (3), Bruno Coignard (1), the RAISIN and Expert Laboratories Group

AFFILIATIONS:

1. French Institute for Public Health Surveillance (Institut de Veille Sanitaire, InVS), Saint-Maurice, France.
2. Centre de coordination de la lutte contre les infections nosocomiales (CClin) Paris-Nord, Paris, France.
3. Bactériologie-Hygiène, Pitié-Salpêtrière Hospital; Central Infection Control Team, Assistance Publique – Hôpitaux de Paris (AP-HP), France.

BACKGROUND:

Carbapenemase-producing Enterobacteriaceae (CPE) have been reported increasingly worldwide. They are becoming a major clinical and public health concern as they constitute the last step towards a therapeutic dead end. In France, resistance of Enterobacteriaceae to carbapenems remains uncommon (0.16% for *K. pneumoniae* in invasive infections, EARS-Net, 2009). The objectives of this study were to quantify and describe characteristics of CPE episodes reported to InVS during February 2004 to June 2011.

METHODS:

A case was defined as a patient infected or colonised by a CPE that was confirmed by a reference or expert laboratory. An episode was defined as one sporadic case or several cases related by an identified chain of transmission. All the episodes notified by healthcare facilities through the French Healthcare-Associated Infections Early Warning and Response System (Raisin) or directly by microbiologists were included in this study.

RESULTS:

A total of 67 episodes were reported with a sharp increase in the number of notifications in the last three years. *K. pneumoniae* and *E. coli* were the most frequent bacteria involved. OXA-48 and KPC were the most frequent carbapenemases reported. A total of 193 patients were involved; 30% were infected. For 53 episodes associated with cross-border transfers, the index case had been hospitalized abroad within the previous year; Greece (16), Morocco (11) and India (7) were the most frequently reported countries. For 14 episodes, no link with a foreign country has been identified; 12 were associated with OXA-48 carbapenemase.

CONCLUSIONS:

These results strongly suggest that CPE are emerging in France. Reinforcement of screening and control measures and antimicrobial stewardship are urgently needed at national and international level in order to contain the spread of CPE.

PRESENTED BY: DR SOPHIE VAUX

Keywords: Drug Resistance, Bacterial; Carbapenemase; Enterobacteriaceae

ESCAIDE reference number: 20110036

ANTIMICROBIAL RESISTANCE/ HEALTH CARE ASSOCIATED INFECTION

Usage of Spa Typing of Methicillin-resistant Staphylococcus aureus

Lucia Hrivniakova (1, 2), D. Schmid (2), W. Ruppitsch (2), A. Wechsler-Fördös (3), L. Peter (3), F. Geppert (3), F. Allerberger (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Austrian Agency for Health & Food Safety, Vienna, Austria
3. Hospital Rudolfstiftung, Vienna, Austria

BACKGROUND:

Spa typing, a single-locus DNA sequencing of the surface protein A (spa) coding gene, is a rapid and reliable method for methicillin-resistant *Staphylococcus aureus* (MRSA) strain characterisation. A cross-sectional study of MRSA positive patients was conducted to examine associations between spa types and clinical relevance of MRSA (i.e. colonisation, infection), acquisition of MRSA (i.e. health-care-associated, HA; community-associated, CA), type of MRSA infection (i.e. invasive, non-invasive infection) and patient outcome.

METHODS:

A total of 381 MRSA positive patients including 239 (62.7%) cases of HA-MRSA (MRSA detection ≥ 48 h after admission) and 133 (34.9%) of CA-MRSA (MRSA detection ≤ 48 h and no health care risk factors) were prospectively identified in an 800 bed hospital in Vienna between 2005 and 2008. Of these, 222 met the Centers for Disease Control (CDC) definition for MRSA infection and 159 for colonisation. Spa types were available in 349 patients. Fatal outcome was defined as death occurring within 4 weeks after MRSA detection. Crude and adjusted odds ratios (OR) and 95% confidence intervals (CI) using logistic regression analysis were calculated.

RESULTS:

The five most frequent spa types found were t190, t032, t041, t008 and t001.

Spa t190 was independently associated with HA-MRSA (aOR=1.89; 95% CI: 1.12-3.69) and spa t008 with CA-MRSA in hospitalised patients (aOR=2.5; 95% CI: 1.42-9.09). The t008 was more frequently found in MRSA infection than colonisation (aOR=3.6, 95% CI: 1.21-10.40). No association was found between spa type and the type of infection and the outcome.

CONCLUSIONS:

Spa t190 was found to be associated with HA-MRSA and spa t008 with CA-MRSA in hospitalised patients. Spa typing did not prove to be eligible as determinant of the infection type and the patient outcome.

PRESENTED BY: DR LUCIA HRIVNIAKOVA

Keywords: MRSA, HA-MRSA, CA-MRSA, spa type

ESCAIDE reference number: 20110049

ANTIMICROBIAL RESISTANCE/ HEALTH CARE ASSOCIATED INFECTION

Risk factors for relapse in a *Clostridium difficile* infection (CDI) outbreak in Cape Breton, Nova Scotia, Canada 2011

Freda Lam (1)(2), M. Helferty (1), M. Baikie (3), M. MacLean (4), Y. Hussein (4) and D. Lahey (4)

AFFILIATIONS:

1. Canadian Field Epidemiology Program, Public Health Agency of Canada, Ottawa, Ontario, Canada
2. Ontario Agency for Health Protection and Promotion, Toronto, Ontario, Canada
3. Nova Scotia Department of Health and Wellness, Halifax, Nova Scotia, Canada
4. Cape Breton District Health Authority, Sydney, Nova Scotia, Canada

BACKGROUND:

Clostridium difficile infection (CDI) is a significant cause of health-care-associated diarrhea that may result in surgical interventions and death. Relapse from CDI can result in a longer hospital stay, greater antibiotic usage and increased morbidity and mortality. This study examined the risk factors for relapse amongst CDI outbreak-associated cases in the Cape Breton, Nova Scotia, Canada between January 1 and May 6, 2011.

METHODS:

Chart review of CDI outbreak-associated cases, including hospital-acquired, healthcare-associated and other-acquired cases, was completed to collect information on antibiotic use, medical history, treatment and outcomes. Relapsed cases were those with new clinically compatible CDI in recovered cases that were previously laboratory confirmed within 8 weeks of symptom onset. Logistic regression was used to determine any significant risk factors for relapse CDI for all cases and hospital-acquired cases.

RESULTS:

Sixty-four cases were identified, with 16 cases (28.6%) that had at least one relapse documented during the outbreak period. Past emergency room visit was significant in bivariate analysis, only probiotic treatment (OR= 22.6 [CI: 3.2-158.0]) was found to increase the odds of relapse, after adjusting for age in a multivariate model. Among the 49 hospital-acquired CDI cases (78% of all cases), only probiotic treatment (OR=34.9 [CI: 4.3-279.9]) increased the odds of relapse after adjusting for age, while past moxifloxacin use was not significant after multivariate analysis.

CONCLUSIONS:

As the role of probiotics has not been indicated as a risk factor for relapse in previous research, the results from this outbreak suggests that this may be important when considering treatment options for CDI cases. Further research is needed to determine the role of probiotics as CDI treatment and in CDI relapse.

PRESENTED BY: MS FREDA LAM

Keywords: *Clostridium difficile*, relapse, disease outbreaks, probiotics, antibiotics

ESCAIDE reference number: 20110076

ANTIMICROBIAL RESISTANCE/ HEALTH CARE ASSOCIATED INFECTION

Risk factors for transmission of methicillin-resistant *Staphylococcus aureus* in neonatal intensive care: a case control study

Matthias Nachtnebel (1, 2, 3), G. Falkenhorst (1), J. Benzler (1), M. Dehnert (1), C. Bühner (4), P. Piening (5), M. Behnke (5), F. Schmid (5), T. Eckmanns (1)

AFFILIATIONS:

1. Department for Infectious Disease Epidemiology, Robert Koch Institute (RKI), Berlin, Germany
2. Post Graduate Training in Applied Epidemiology, Robert Koch Institute (RKI), Berlin, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
4. Charité University Medical Center, Berlin, Germany
5. Institute of Hygiene and Environmental Medicine, Charité University Medical Center, Berlin, Germany

BACKGROUND:

Methicillin-resistant *S. aureus* (MRSA) is frequently reported to cause outbreaks in neonatal intensive care units (NICU). We initiated an epidemiological study to identify risk factors for transmission of MRSA in the setting of a NICU in Berlin.

METHODS:

We conducted a matched case-control study, defining cases as infants admitted between February 8th and August 31st 2010 with at least one positive culture for MRSA spa-type t032. Controls were MRSA-negative infants from the same NICU, matched for birth-weight and age. For each child and day, we defined a prospective and a retrospective MRSA-status and assigned related risk-scores: the prospective status mirrored actual knowledge of swabbing results on a given day; the retrospective status information available in hindsight. We computed matched odds ratios (OR) and 95% confidence intervals (CI) for possible risk factors using exact logistic regression.

RESULTS:

The overall attack rate was 4% (27/745), and 25% (17/68) among infants of birthweight <1500 g. Presence of unrecognized MRSA-positive infants on the ward (OR=9.4; 95% CI 1.7-394.6), contact with a particular staff member (OR= 9.3, 95% CI 1.0-413.9), birth by emergency caesarean (OR= 9.0, CI 1.1-435.8), blood transfusion (OR=20.9; CI 2.3-Inf) and higher infant-to-nurse ratio (OR= 28.0 per unit, CI 1.5-1173.4) were associated with a higher chance for MRSA transmission, as was a higher risk score (OR= 1.0, CI 1.0-1.1 per point).

CONCLUSIONS:

Our results suggest that rapid testing for and communication of MRSA-status is important to reduce transmission. Individual health care workers (later unveiled as MRSA-positive) as well as understaffing may be risk factors for nosocomial MRSA transmission. This suggests specific interventions, such as regular screening of staff, limiting patient contact of MRSA-positive staff and avoidance of understaffing.

PRESENTED BY: MR MATTHIAS NACHTNEBEL

Keywords: MRSA, cross-infection, infants, intensive care, testing

ESCAIDE reference number: 20110152

PARALLEL SESSION ABSTRACTS

ANTIMICROBIAL RESISTANCE/ HEALTH CARE ASSOCIATED INFECTION

Risk of invasive illness and death among patients with campylobacter infections with antimicrobial-susceptible and resistant strains

S. Gubbels (1, 2), J. Simonsen (3), M. Helms (4), S. Ethelberg (2), K. Mølbak (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology (EPIET), European Centre for Disease Prevention and Control, Stockholm, Sweden
2. Department of Epidemiology, Statens Serum Institut, Copenhagen, Denmark
3. Department of Epidemiological Research, Statens Serum Institut, Copenhagen, Denmark
4. Department of Infectious Diseases, Copenhagen University Hospital (Hvidovre)

BACKGROUND:

A previous Danish study showed that invasive illness and death after campylobacter infection may be associated with quinolone- and macrolide-resistant *Campylobacter*. The current study aimed to confirm this finding in a larger cohort.

METHODS:

A registry-based cohort study was performed among patients with laboratory confirmed campylobacter infection from 1996–2007. ICD-10 codes for severe outcomes and underlying illness were derived from the National Patient Registry. Relative hazard rates of invasive illness and all-cause mortality were calculated using conditional proportional hazard regression. For each patient ten persons were randomly selected from the general population, matched on age, sex and county of residence to adjust for underlying illness by calculating a co-morbidity index.

RESULTS:

In total 11819 patients with campylobacter infection were identified, with a median age of 29 years (interquartile range 19–44 years). Of those, 9141 (77.3%) had quinolone- and macrolide-susceptible strains, 2520 (21.3%) quinolone-resistant strains and 85 (0.7%) macrolide-resistant strains. After adjustment for co-morbidity, patients infected with quinolone-resistant strains had a 0.81-fold higher hazard of dying within 90 days of infection than patients with susceptible strains (95% CI 0.18–3.60). This hazard was 6.43-fold higher (95% CI 1.80–23.01) for patients with macrolide-resistant strains. Patients with quinolone-resistant strains had a 2.54-fold higher hazard of dying (95% CI 1.36–4.72) 90–365 days after infection. For patients with macrolide-resistant strains this hazard was ~1 (95% CI 0.13–6.97). The hazard for invasive illness was not significantly different.

CONCLUSIONS:

This study confirmed that patients with antimicrobial-resistant *Campylobacter* infections had a higher risk of death. It did not show an increased risk of invasive illness. As anti-microbial resistance is mainly a consequence of anti-microbial use in food-animals, this study reinforces the need to limit veterinary anti-microbial use.

PRESENTED BY: DR SOPHIE GUBBELS

Keywords: Campylobacter, anti-microbial resistance

ESCAIDE reference number: 20110230

CONTRIBUTION OF MODELLING TO APPLIED EPIDEMIOLOGY

Modelling the Transfusion Transmission Risk of Emerging Infectious Diseases

W. Oei (1), M. P. Janssen (1), C. L. van der Poel (1), J. van Steenberghe (2), S. Rehm (3), M. Kretzschmar (1,2)

AFFILIATIONS:

1. Julius Centre for Primary Care and Health Sciences UMC Utrecht, Utrecht, the Netherlands.
2. National Institute for Public Health and the Environment RIVM, Bilthoven, the Netherlands.
3. European Centre for Disease Prevention and Control, Stockholm, Sweden.

BACKGROUND:

Increasing identification of transfusion transmission (TT) of emerging infectious diseases (EIDs) raised the awareness that there may be more EIDs posing a potential risk for blood safety. A timely risk assessment is deemed necessary to prevent the TT feeding into the ongoing outbreak or initiating an outbreak elsewhere.

METHODS:

A generic model to evaluate the TT risk to blood safety during an EID outbreak was developed that reflects the dynamics of EIDs and the practice of blood transfusion. Infection risks in five different compartments were accounted for: (1) the risk of infection in the donor population, (2) the risk of having infected donations, (3) released components, (4) end products, and (5) the risk of infection amongst recipients. The first step was estimated using biological characteristics of EIDs. The following three steps were estimated using the practice and existing safety measures in the blood transfusion chain. The disease severity distribution amongst recipients from receiving infected end products is not well known. Therefore, this was assumed to be similar to that of the general population. The model was tested using data on a recent outbreak of Q fever in the Netherlands.

RESULTS:

Notification of 566 cases resulted in a donor prevalence of 0.08% (1), potentially leading to 64 infected donations (2), blood components (3), and red blood cell products (4) per 10,000 donations without implementation of further safety measures. One of the infected recipients may die from receiving infected products (5).

CONCLUSIONS:

The generic model can be applied to quantify the impact of the Q fever outbreak or other EIDs on the blood safety, which may support targeted preventive measures for transfusion practices and public health policy makers.

PRESENTED BY: MS WELLING OEI

Keywords: Communicable diseases, emerging, transfusion, models

ESCAIDE reference number: 20110081

CONTRIBUTION OF MODELLING TO APPLIED EPIDEMIOLOGY

Risk factors for gonorrhoea in London, 2009–10: A Bayesian spatial modelling approach

le Polain de Waroux O (1,2), Crook P (1), Maguire H (1), Harris R (3)

AFFILIATIONS:

1. Health Protection Agency, London and South East Regional Epidemiology Units 151 Buckingham Palace Road, London, SW1W 9SZ, UK
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Control and Prevention, Tomtebodavägen 11A, 171 65 Solna, Stockholm, Sweden
3. Health Protection Agency, Statistics, Modelling and Economics Department, Centre for Infections, 61 Colindale Avenue, London NW9 5EQ, UK

BACKGROUND:

London has the highest incidence of gonorrhoea in the UK. We explored the small area spatial distribution of gonorrhoea in London, its spatial correlation and individual and ecological risk factors in an attempt to guide targeted public health interventions.

METHODS:

Surveillance data from Genitourinary Medicine (GUM) clinics were obtained for 2009–10. We performed the analysis at the census area level (median population size 7,200). We obtained demographic and socioeconomic data by census area from the Office for National Statistics. We used a Bayesian mixed effects Poisson regression model including spatial random effects, with posterior distributions obtained using a Monte-Carlo Markov-Chain sampling algorithm.

RESULTS:

Overall 12,452 patients were included in the analysis. The final model, which accounted for spatial correlation, showed that incidence was lower in females (Incidence Rate Ratio (IRR) 0.38 (95% Credibility Intervals (95%CrI) 0.34–0.41) and highest in the 16–29 years old (IRRs (95%CrI) for the 30–44 was 0.51 (0.49–0.54) in males and 0.15 (0.12–0.17) in females. Compared to whites, incidence was lower in South Asian males and females (IRR (95%CrI) 0.39 (0.35–0.44); 0.55 (0.39–0.78)) but higher in Black Caribbean males and females (IRR (95%CrI) 2.61 (2.44–2.80); 5.01 (4.13–6.04)). The incidence by area increased with deprivation, increasing proportions of teenage pregnancies and students. The spatial correlation was explained to a great extent by the covariates, but we also identified areas with a spatial effect beyond what was explained by model covariates.

CONCLUSIONS:

Spatial modelling using a Bayesian approach enabled the identification of particular sociodemographic and spatial risk factors, accounting for spatial autocorrelation. These findings will be useful to planners of sexual health services to identify areas for targeted interventions.

PRESENTED BY: DR OLIVIER LE POLAIN DE WAROUX

Keywords: Spatial modelling, Bayesian, gonorrhoea, risk factors

ESCAIDE reference number: 20110097

CONTRIBUTION OF MODELLING TO APPLIED EPIDEMIOLOGY

Estimating the cost-effectiveness of the Swedish mass-vaccination against pandemic influenza

Jessica Dagerhamn (1), M. Grönwald (1), A. Linde (1), A. Tegnell (2), L. Brouwers (1, 3)

AFFILIATIONS:

1. Swedish Institute for Infectious Disease Control, Solna, Sweden
2. National Board of Health and Welfare, Stockholm, Sweden
3. Royal Institute of Technology, School of ICT, Kista, Sweden

BACKGROUND:

In Sweden free vaccination against pandemic influenza A (H1N1) was offered to everyone. In this study modeling was used to make a cost-utility analysis of the vaccination approach.

METHODS:

Data from several sources were used to estimate the morbidity, mortality and absenteeism from infections and vaccination. An individual-based model was calibrated to reproduce the outbreak regarding infections per week and health-care consumption. Prior immunity, based on a serologic study, and number of vaccine doses administered per week and county were included in the baseline scenario. Thereafter simulations were run assuming the same infectivity but without vaccination and with three weeks earlier start of the vaccination. Finally, a more severe influenza outbreak was simulated.

RESULTS:

Approximately 1.5 million Swedes were infected, 900 000 asymptotically. Six million people (60% of the Swedes) were vaccinated. The cost for vaccination amounted to 198 million €. In total, the societal cost of the pandemic was 570 million €. The vaccination reduced the cost with 65 million €, giving a cost of 137 000 € per saved Quality Adjusted Life Year (QALY). According to de facto cost thresholds stated by the Dental and Pharmaceutical Benefits Agency, TLV, the Swedish mass-vaccination was not cost-effective but it would have been if vaccination had started three weeks earlier. With a more severe form of influenza mass-vaccination would have been highly cost-effective, giving a net monetary benefit of 300–1100 million € compared to no vaccination.

CONCLUSIONS:

Mass-vaccination against the 2009 influenza pandemic was not cost-effective in Sweden according to TLV thresholds. With a start three weeks earlier it would have been cost-effective. In a more severe influenza the vaccination would have been highly cost effective.

PRESENTED BY: DR JESSICA DAGERHAMN

Keywords: Influenza, model, simulation, health economy, intervention, policy

ESCAIDE reference number: 20110303

PARALLEL SESSION ABSTRACTS

CONTRIBUTION OF MODELLING TO APPLIED EPIDEMIOLOGY

Computing synthetic contact matrices through modeling of social mixing patterns relevant to infectious disease transmission

Laura Fumanelli (1), M. Ajelli (1), P. Manfredi (2), A. Vespignani (3), S. Merler (1)

AFFILIATIONS:

1. Bruno Kessler Foundation, Trento, Italy
2. Department of Statistics and Mathematics applied to Economics, University of Pisa, Italy
3. Indiana University School of Informatics and Computing, Bloomington IN, USA

BACKGROUND:

Contact patterns represent the key to understanding transmission dynamics of human-to-human infectious diseases. New approaches aimed at estimating who meets whom (where, when, how long and how often) have recently been proposed, ranging from direct collection of contact data from sample surveys, to inference from time-use or census data through detailed model simulations.

METHODS:

We build a virtual society of 26 European countries, using routinely collected data on age structure, households size and composition, educational systems, employment rates, schools and workplaces size to generate highly detailed synthetic populations. Based on this structure, we compute a matrix of adequate contacts for each country.

RESULTS:

Our analysis allows a large scale comparison of mixing patterns in Europe, highlighting a general common pattern as well as some country-specific differences, both in contact matrices and in simulated seroprevalence profiles by age; for instance, all contact matrices show a dominant and two secondary diagonals, however their relative magnitude is variable. A detailed comparison with Polymod matrices for six countries shows a general good agreement, since most statistical variation between the two can be captured by a single scale factor. Moreover, by using both proposed and Polymod matrices for simulating a baseline pandemic event, we found qualitatively comparable seroprevalence profiles by age.

CONCLUSIONS:

This study aims to represent an advance in the knowledge of mixing patterns relevant to infectious disease transmission, giving a flexible and easily applicable method for deriving contact matrices based on routinely collected data. We believe that this work would greatly help improve the accuracy of mathematical models predictions which are increasingly used to support public health decisions.

PRESENTED BY: DR LAURA FUMANELLI

Keywords: Human mixing patterns; Individual based models; Sociodemography; Seroprevalence profile by age

ESCAIDE reference number: 20110309

CONTRIBUTION OF MODELLING TO APPLIED EPIDEMIOLOGY

Contact patterns and transmission of varicella in Europe

Emanuele Del Fava (1), L. Fumanelli (2), S. Merler (2), L. Marangi (3), M. Ajelli (2), A. Melegaro (4), Z. Shkedy (1), G. Scalia Tomba (5), C. Rizzo (6), P. Manfredi (3)

AFFILIATIONS:

1. I-Biostat, Hasselt University, Belgium.
2. Predictive models for Biomedicine and Environment, Fondazione Bruno Kessler, Trento, Italy.
3. Dipartimento di Statistica e Matematica Applicata all'Economia, University of Pisa, Pisa, Italy.
4. Dondena Centre for Social Dynamics, Università Commerciale Luigi Bocconi, Milano, Italy.
5. Dipartimento di Matematica, Università di Roma 2, Roma, Italy.
6. CNESPS, Istituto Superiore di Sanità, Roma, Italy.

BACKGROUND:

In the mathematical modeling of communicable infections, as VZV, a critical step is represented by the estimation of transmission parameters. These include contact patterns by age, and transmission "rates" per single contact.

METHODS:

We estimate transmission parameters by maximum likelihood relying on (a) serological data of VZV in Europe (available in 14 countries), on (b) observed contact matrices based on recently collected contacts data (8 countries), on (c) synthetic contact matrices computed by simulation of realistic socio-demographic IBM for those European countries where census data were available (26 countries), and (d) traditional "Who Acquires the Infection From Whom" (WAIFW) matrices. Performances by the various approaches are compared by goodness-of-fit measures. Bootstrap techniques are used to evaluate the accuracy of the involved estimates.

RESULTS:

Simulated "overall" contact matrices with a single transmission parameter always perform better than corresponding observed matrices in explaining serological data, providing therefore a robust, easily available tool, for VZV modeling on the large scale, given its availability in all European countries. Questionnaire-based matrices, which unlike simulated ones are available for many different types of contacts, illuminate on the type of contacts which better explain infection data. Suitably designed WAIFW also perform very well. It is finally shown that contact data account for the larger part of the overall uncertainty of estimates.

CONCLUSIONS:

Our findings offer a more reliable picture, compared to previous work, of the epidemiology of VZV in Europe and provide the basis for the modeling of VZV vaccination, particularly as regards the contribution of transmission to the overall modeling uncertainty. Unfortunately this uncertainty is concentrated at high ages, which are those at risk for immunity boosting and Zoster development.

PRESENTED BY: MR EMANUELE DEL FAVA

Keywords: Varicella-zoster virus, transmission, contact patterns, mathematical modelling

ESCAIDE reference number: 20110340

FOOD- AND WATER-BORNE DISEASES

Burden of acute gastroenteritis and health care seeking behaviour in France: a population based study

Dieter Van Cauteren, H. de Valk, S. Vaux, Y. Le Strat, V. Vaillant

AFFILIATIONS:

Institut de Veille Sanitaire (InVS) (French Institute for Public Health Surveillance), Saint-Maurice, France

BACKGROUND:

In France, surveillance of acute gastroenteritis (AG) is based on notification from general practitioners (GP), hospital physicians and laboratories. However, this type of surveillance underestimates the true burden of AG due to underreporting, and does not capture cases who do not seek medical care.

METHODS:

We conducted a population based retrospective cross-sectional telephone survey between May 2009 and April 2010 in order to obtain more accurate estimates of the incidence and the burden of AG and to describe health care seeking behaviour for AG.

RESULTS:

Of the 10080 persons included in the survey, 260 respondents reported 263 episodes of AG in the preceding 28 days. The incidence rate of AG was estimated at 0.33 cases per person-year (CI 95% 0.28–0.37). Incidence peaked in the 0–5 year's age group (0.74 cases per person-year CI 95% 0.55–0.93) and declined significantly with age ($p < 10^{-4}$). In the 30–64 years age group, the incidence rate was significantly higher among females than males (0.32 vs. 0.16 cases per person-year, $p = 0.007$). One out of every three cases consulted a physician for their illness, essentially the GP. Cases with a long duration of illness and young children are more likely to consult.

CONCLUSIONS:

Our results indicate AG causes a significant burden of illness in the French population and is a frequent cause for consultation. Despite differences in the incidence of AG, overall age and sex patterns were similar to those observed in other developed countries. These results allow a more accurate interpretation of the data derived from existing healthcare provider-based AG surveillance systems.

PRESENTED BY: MR DIETER VAN CAUTEREN

Keywords: Epidemiology, acute gastroenteritis, incidence, surveillance

ESCAIDE reference number: 20110093

FOOD- AND WATER-BORNE DISEASES

Raw grated beetroots linked to several outbreaks of sudden onset gastrointestinal illness, Finland 2010

Andreas Jacks (1, 2), S. Toikkanen (2), A. Pihlajasaari (3), T. Johansson (3), M. Hakkinen (3), M. Kuusi (2), R. Rimhanen-Finne (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. National Institute for Health and Welfare (THL), Helsinki, Finland
3. Finnish Food Safety Authority (EVIRA), Helsinki, Finland

BACKGROUND:

In Finland, 7/44 (16%) of reported foodborne outbreaks in 2010 were linked with consumption of raw beetroot, occurring at institutional canteens throughout the country from January to November. We studied these outbreaks in order to characterize the illness and support ongoing aetiological research.

METHODS:

Cases were defined as anyone reporting nausea or stomach pain within 24 hours after consuming lunch at one of the canteens. We inquired about food items consumed. We calculated risk ratios (RR) with 95% confidence intervals (CI) for each exposure, using small sample adjustment (Jewell's method) when needed and Fisher's exact test for significance testing. Meta-analysis was done according to DerSimonian-Laird. The Finnish Food Safety Authority (EVIRA) conducted environmental and microbiological investigations.

RESULTS:

From 7 retrospective cohort studies including 623 persons, 124 cases (20% attack rate) were identified; median age was 38 years (15–61) and 82% were female. Median incubation period was 40 minutes (≤ 5 min–21 h) and duration of symptoms 5 hours (5 min–8 days). Analyses of faecal and vomit samples revealed no foodborne pathogens or toxins. In 6 outbreaks, eating raw grated beetroot was the only risk factor (RR ranging from 7.3 to 13.1, $p < 0.05$). In meta-analysis, RR for beetroot was 9.0 (95% CI 6.1–13.3), attributable fraction 89%. Canteens refrigerated ready-peeled, rinsed and packed beetroots for 2–9 days before serving. In 4/7 samples received from different producers and outbreaks, *Pseudomonas fluorescens* was detected (~106 CFU/g), total bacterial counts being 107–109 CFU/g. *Staphylococcus aureus* and *Bacillus cereus* levels were < 100 CFU/g in 2 samples.

CONCLUSIONS:

Laboratory investigations of the possible pathogenicity of *Pseudomonas fluorescens* are ongoing. After EVIRA advised against eating raw beetroots in November 2010, no new outbreaks have been detected.

PRESENTED BY: DR ANDREAS JACKS

Keywords: Raw beetroot, Gastrointestinal illness, repeated outbreaks, meta-analysis

ESCAIDE reference number: 20110168

PARALLEL SESSION ABSTRACTS

FOOD- AND WATER-BORNE DISEASES

Spatial distribution and social risk factors for hospitalised cases of Rotavirus infections in neighbourhoods in Berlin, Germany, 2007–2009

Hendrik Wilking (1, 2, 3), M. Höhle (1), E. Velasco (1), M. Suckau (4), J. Bätzing-Feigenbaum (5), T. Eckmanns (1)

AFFILIATIONS:

1. Department for Infectious Disease Epidemiology, Robert Koch Institute, Berlin
2. Postgraduate Training for Applied Epidemiology (PAE), Berlin, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), Stockholm, Sweden
4. Senate of Berlin's Department for Health, Environment and Consumer Protection, Berlin, Germany
5. State Office of Health and Social Affairs, Berlin, Germany

BACKGROUND:

Rotavirus infections are a leading cause of acute gastroenteritis among infants in Germany. We analysed the distribution of hospitalised patients with Rotavirus infections in an urban setting and the association to different socio-demographic and economic variables on the small area incidence in Berlin in order to identify previously unknown spatial associations and risk factors.

METHODS:

Our spatial analysis included 447 neighbourhood areas of similar size in Berlin. The case definition included all laboratory-confirmed hospitalised patients because of Rotavirus infections mandatorily notified between 01/01/2007 and 31/12/2009 excluding travel-associated and nosocomial hospital-associated infections. Age and gender-standardized incidences were computed and analysed for statistical significant differences in incidence between regions. We analysed the association between incidences at neighbourhood level and socio-demographic variables within a hierarchical spatial Bayesian Poisson regression model.

RESULTS:

During the study period, we identified 2,370 cases. The analysis of spatial associations identified specially affected urban quarters. In the final regression model, we identified two risk groups: incidence increased by 6.0% for each percent unemployed inhabitants (95% CI: 4.3%–7.7%) and by 0.6% for each percent of children attending day care (95% CI: 0.04%–1.2%).

CONCLUSIONS:

This is the first time that the effect of socio-demographic and economic variables on the incidence of Rotavirus infections could be observed in Germany. We cannot disentangle whether the impact of unemployment on disease incidence is due to an increased number of cases in all families or alternatively only in families which are directly affected by unemployment due to the ecological study-design. Specific risk-pathways on an individual level remain subject to future examinations. Appropriate targeting of public health promotion programmes could be achieved by combining the criteria of neighbourhood and groups of people identified in this study.

PRESENTED BY: DR HENDRIK WILKING

Keywords: Rotavirus infections; Urban Health; Cluster Analysis; Social Environment; Risk Factors; Bayes Theorem

ESCAIDE reference number: 20110292

FOOD- AND WATER-BORNE DISEASES

Serotypes and other factors associated with hospitalisation and death in reported salmonellosis cases, Germany, 2004–2009

European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden (2). Postgraduate Training for Applied Epidemiology (PAE, German FETP), Robert Koch-Institute, Germany (3)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Postgraduate Training for Applied Epidemiology (PAE, German FETP), Robert Koch-Institute, Berlin, Germany
3. Department for Infectious Disease Epidemiology, Robert Koch Institute, Berlin, Germany

BACKGROUND:

Non-typhoidal *Salmonella* spp. is one of the most commonly reported food-borne pathogens and an important cause of morbidity. Human infection with *Salmonella* spp. is reportable in Germany. Our aim was to identify risk factors for hospitalisation and death among reported salmonellosis cases in Germany to guide case-management.

METHODS:

We analysed reporting data for the years 2004–2009. Case information included age, sex, serotype, place of infection, outbreak-association, extra-intestinal manifestations, hospitalisation, and death. Association of serotype with hospitalisation was investigated using logistic regression analysis adjusted for potential confounders, and with death by Fisher's exact test, with *S. Enteritidis* as reference category for both. A p-value below 0.05 was considered statistically significant.

RESULTS:

Among 291,613 reported cases, 71,587 (25%) were hospitalised and 241 (0.1%) died. Serotype information was available for 256,766 (88%) cases. The most commonly reported serotypes were *S. Enteritidis* (68%) and *S. Typhimurium* (25%). Children <1, 1–4 and 5–17 year-olds and over 64 year-olds had higher odds for hospitalisation than adults 18–64 years of age; (OR=1.78, OR=1.18, OR=1.23, OR=2.32, respectively, all $p < 0.05$). Infections acquired in Germany, extra-intestinal manifestations, and sporadic cases had higher odds for hospitalisation; (OR=1.37, OR=2.10, OR=1.32, respectively, all $p < 0.05$). Cases infected by *S. Typhimurium* (OR=1.22) and *S. Choleraesuis* (OR=3.06) had statistically significantly higher odds for hospitalisation than those infected by *S. Enteritidis*. Cases infected by *S. Typhimurium* (OR=1.42), *S. Goldcoast* (OR=5.11), *S. Livingstone* (OR=6.63), and *S. Choleraesuis* (OR=46.27) had statistically significantly higher odds to die than those infected by *S. Enteritidis*.

CONCLUSIONS:

S. Typhimurium and some rare serotypes more frequently lead to hospitalisation and death than *S. Enteritidis*. Age, extra-intestinal manifestations and serotype, if already present, should be taken into account to tailor clinical management of salmonellosis.

PRESENTED BY: MS SANDRA DUDAREVA

Keywords: Salmonella, Serotype, Salmonellosis, Hospitalisation, Death

ESCAIDE reference number: 20110218

FOOD- AND WATER-BORNE DISEASES

Risk factors for sporadic domestically acquired campylobacter infections in Norway 2010–2011: preliminary results of a nation-wide prospective case-cohort study

Ricardo Mexia (1, 2), Line Vold (2), Tone Bruun (2), Georg Kapperud (2), Karin Nygård (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Norwegian Institute of Public Health, Oslo, Norway

BACKGROUND:

In Norway, Campylobacter is the leading cause of bacterial enteritis, with an incidence of 2848 (59.3/100,000) reported infections in 2009. The aim of this study is to identify risk factors for domestically acquired Campylobacteriosis in Norway in order to guide stakeholders and advise on preventive measures to the public.

METHODS:

Between October 2010 and September 2011 we are conducting a prospective, nationwide case-cohort study. Cases are recruited weekly and defined as persons living in Norway with reported laboratory-confirmed Campylobacter infection. Monthly, 400 controls are randomly selected from the population registry. Those reporting travel abroad two weeks before illness onset are excluded. We collect data on dietary, behavioral and occupational risk factors using a self-administered questionnaire. We performed interim analysis and calculated univariate odds ratios (OR) with 95% confidence intervals (CI).

RESULTS:

From October 2010 to March 2011 we included 169 cases and 781 controls (response rate 64.5% and 37.5% respectively). Univariate analysis on exposures associated with >10 cases and significance $p < 0.005$ showed higher risk in participants eating chicken (OR=1.9; 95% CI:1.2-3.0), raw/undercooked meat (OR=2.4; 95% CI:1.2-4.4) [specially raw/undercooked poultry (OR=13.1; 95% CI:4.7-41.9)], having a dog in the household (OR=2.4; 95% CI:1.6-3.6), living on a farm with animals (OR=4.3; 95% CI:2.2-8.1), being in contact with animals (OR=2.8; 95% CI:1.7-4.6), [specially bovine animals (OR=5.7; 95% CI:2.4-13.5)] or drinking water outside the home (OR=2.0; 95% CI:1.2-3.2).

CONCLUSIONS:

Our preliminary results identify already known risk factors for campylobacteriosis and thus support the advice on preventive measures given to the public. However, since campylobacteriosis has a known seasonal pattern, increasing in summer months, they should be interpreted cautiously. Results from the full 12 months data collection will be presented at ESCAIDE.

PRESENTED BY: DR RICARDO MEXIA

Keywords: Campylobacter infections, Food contamination, Prospective Studies, Risk factors

ESCAIDE reference number: 20110307

OUTBREAKS 1

Salmonella Typhimurium Outbreak Associated with Imported Smoked Pork Tenderloin in Denmark, January to March 2011

O. Wójcik (1, 2), C. Kjelsø (2), K. Kuhn (2), L. Müller (2), T. Jensen (3), M. Kjeldsen (4), S. Ethelberg (2, 3)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control, Stockholm, Sweden
2. Department of Epidemiology, Statens Serum Institut, Copenhagen, Denmark
3. Danish Veterinary and Food Administration, Copenhagen, Denmark
4. Department of Microbiology Surveillance and Research, Statens Serum Institut, Copenhagen, Denmark

BACKGROUND:

An outbreak of salmonellosis (Salmonella Typhimurium, phage type DT120) occurred from January 26-March 15, 2011, affecting 22 persons in Denmark. Hypothesis-generating patient interviews gave suspicion that smoked pork tenderloin may have been the source of infection.

METHODS:

A retrospective matched (1:2) case-control study was conducted. A case was defined as a person residing in Denmark whose stool sample tested positive for S. Typhimurium DT120, multilocus variable-number tandem repeat profile 1343, from January 26-March 15, 2011. Controls were matched to cases on age, gender and municipality of residence.

RESULTS:

Almost three times more females (71.4%) than males (28.6%) were cases and eight of the cases (38.1%) were between 60–69 years old. Of 21 interviewed cases, 19 (90.5%) indicated they typically ate smoked pork tenderloin ≥ 1 times a week, compared with 13 (33.3%) of 39 interviewed controls (mOR=19.6; 95% CI, 2.6-152.5). Eighteen (85.8%) cases indicated they might have consumed smoked pork tenderloin the week before becoming sick compared with 1 (4.0%) control who had eaten it a week before interview. Two cases provided the brand name of the product and the supermarket where it was purchased. No samples of the product could be tested for S. Typhimurium because none of the cases had any leftovers and the supermarkets also had none available. No similar outbreaks were reported in other countries.

CONCLUSIONS:

The results show a strong statistical association between consumption of smoked pork tenderloin and Salmonella infection. The Rapid Alert System for Food and Feed was used to notify these findings to the authorities in the products' country of origin. The smoked pork tenderloin from the brand in question, dating from January 1-May 1, 2011, was recalled from the market.

PRESENTED BY: DR OKTAWIA WÓJCIK

Keywords: Salmonella Typhimurium, case-control study, retrospective, foodborne outbreak, Denmark

ESCAIDE reference number: 20110038

PARALLEL SESSION ABSTRACTS

OUTBREAKS 1

An outbreak of *Salmonella* Enteritidis among working-aged males linked to the mobile food vending industry, Calgary, Canada

Victoria Keegan (1), K Wilkinson (1), J MacDonald (2), W Lau (2), D Greenwald (2), L Crowe (2), R Sandhu (2), S Nunn (2), K McIntyre (2)

AFFILIATIONS:

1. Canadian Field Epidemiology Program, Public Health Agency of Canada, Ottawa, Canada
2. Alberta Health Services Calgary Zone, Calgary, Canada

BACKGROUND:

In October 2010, public health inspectors in Calgary noticed an increase in *Salmonella* Enteritidis (SE) cases. Investigators noted the majority of cases were male, frequently reported manual labour occupations, and patronized mobile vending trucks. A caterer that supplied the trucks was identified as the likely source. The objective of this analysis was to test the hypothesis that working-aged males in manual labour occupations were disproportionately affected in this SE outbreak.

METHODS:

Cases were defined as residents of Calgary Zone with laboratory confirmation of SE phage type 8, 13, or Atypical with onset on or after October 1, 2010. A multivariate analysis was used to compare age, sex, occupation, and severity of outbreak cases to a referent group of SE cases from the twelve months preceding the outbreak. Occupation of each case was categorized using the Standard Occupational Classification (SOC) 2010. SOC categories related to manual labour were collapsed to create a binomial variable. Age was collapsed into working-aged (20–59 years) and non-working aged individuals.

RESULTS:

Of the 104 cases, 79 (76%) were males. Ages ranged from 19 to 68, with a median of 32 years. Outbreak cases were more likely to be of working age (OR 9.68; 95% CI 3.70, 25.3) and have manual labour occupations (OR 10.78; 95% CI 3.19, 36.38) compared to the referent group ($p < 0.001$). Sex confounded the relationship between manual labour occupation and being an outbreak case.

CONCLUSIONS:

The majority of cases were working-aged males with manual labour occupations. Case demographics, particularly when a unique sub-population is disproportionately affected, can provide key information about the potential source of an outbreak. During future outbreaks vending trucks could be considered when working-aged males are disproportionately affected.

PRESENTED BY: MS VICTORIA KEEGAN

Keywords: *Salmonella* Enteritidis, foodborne, outbreak, multivariate analysis

ESCAIDE reference number: 20110110

OUTBREAKS 1

Outbreak of Staphylococcal Food Intoxication at a Wedding Ceremony in Gjumri, Shirak Marz, Armenia, 2009

L. Avetisyan, T. Rush, E. Maes

AFFILIATIONS:

1. South Caucasus Field Epidemiology and Laboratory Training Program (SC/FELTP), Georgia
2. State Hygienic and Antiepidemic Inspectorate, MOH, Armenia, mobile phone: +37493536746, e-mail: avetisyan_lil@yahoo.com

BACKGROUND:

In February 2009, 30 persons with food intoxication were admitted to the local hospital 2–6 hours after start of a wedding ceremony at a restaurant in Gjumri community, Shirak Marz, Armenia. We investigated the cases to reveal etiology, source, transmission route, and to control the outbreak.

METHODS:

Case-patients were wedding participants with high fever, stomach ache, and at least one of the following: vomiting, diarrhea, weakness, low blood pressure. All 360 wedding participants were interviewed for food history. Laboratory investigated stool samples from 29 patients and environmental samples from water (2), foods (53), objects and utensils (31), hands (14) and stools (14) of restaurant workers. We conducted a cohort study of wedding participants.

RESULTS:

We identified 24 additional case-patients during investigation, yielding an overall attack rate of 8.3% among 360 wedding participants. A risk ratio of 4.7 (95%CI: 2.1-11.6) was associated with fish consumption. Fish had been stored under unsanitary conditions for more than 4 days before the wedding. We found *Staphylococcus aureus* in: 3.5% of samples from 31 objects, 28.7% of samples from hands of 14 workers, and 28.3% of food samples. *S. aureus* was not found in stool samples; however, it was isolated from the cooked but not raw fish. Employees with positive hand cultures, also had septic hand wounds.

CONCLUSIONS:

Fish was contaminated during preparation; all 4 workers with wound infections prepared fish. Non-hygienic preparation of fish and storage led to food contamination and outbreak. We closed the restaurant, examined workers for staphylococcal infections, and performed disinfection. We conducted training on hygiene for restaurant food handlers.

PRESENTED BY: DR LILIT AVETISYAN

Keywords: Food intoxication, cohort study, attack rate, risk ratio, staphylococcus aureus, hygiene

ESCAIDE reference number: 20110136

OUTBREAKS 1

Outbreak of Shiga Toxin producing *E. coli* O104:H4 associated with fenugreek sprouts, France, June 2011

Francisco Nogareda (1, 2), N Jourdan-Da Silva (2), FX Weill (3), P Mariani-Kurkdjian (4), G Gault (5), N Ong (5), C Castor (5), D Thevenot (6), E Loukiadis (6), H. Noël (2), D Van Cauteren (2), L King (2), V Goulet (2), G Delmas (2), E Couturier (2), H de

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Institut de Veille Sanitaire, Saint Maurice, France
3. Institut Pasteur. Centre national de référence (CNR) des Escherichia coli et Shigella, Paris, France
4. Laboratoire associé au CNR des Escherichia coli et Shigella, Service de Microbiologie, Hôpital Robert Debré, Paris, France
5. Cellule interrégionale d'épidémiologie (CIRE) Aquitaine, France
6. Laboratoire Nationale de Référence pour les STEC (LNR STEC), Marcy L'Etoile, France

BACKGROUND:

On 22 June 2011, eight cases of haemolytic uraemic syndrome (HUS) and bloody diarrhoea were reported among attendees of an open-day at a community centre on 8 June near Bordeaux. Three cases were confirmed by isolation of *Escherichia coli* O104:H4 stx2+, eae-, aggR+ producing a CTX-M beta-lactamase (STEC O104); the same strain as in the recent sprout-related outbreak in Germany in May 2011. An investigation was initiated to describe the outbreak, identify vehicles for infection and guide control measures.

METHODS:

We conducted a retrospective cohort study among all adults attending the event, including food handlers. Questionnaires addressing food consumption were administered to participants by telephone. A probable case was an attendee who developed HUS or diarrhoea between 8–24 June. Cases were confirmed by isolation of STEC O104:H4 or O104 serology. Relative risks (RR) and 95% confidence intervals (CI95%) by exposure were calculated using a Poisson regression model.

RESULTS:

Eighty eight adults were interviewed, 63 (72%) were women and 72 (82%) were aged between 30–50. Twenty-two (25%) cases were identified. Of these, 17 (77%) were women, 19 (86%) were aged between 30–50, seven (31.8%) developed HUS, five (22.7%) had bloody diarrhoea and ten (45.4%) had diarrhoea. Nine (41%) were confirmed. Those who consumed fenugreek sprouts were 4.4 (CI95%=1.7-10.9) times more likely to be a case than those who did not.

CONCLUSIONS:

These results indicate that fenugreek sprouts were the vehicle of transmission. The occurrence of outbreaks in France and Germany, caused by the same strain and same vehicle supports the hypothesis that seeds used for sprouting were contaminated by STEC O104. Implemented control measures included withdrawing suspected seed batches and advising consumers to avoid the consumption of raw sprouts.

PRESENTED BY: MR FRANCISCO NOGAREDA

Keywords: *E. coli* O104:H4, raw sprouts, retrospective cohort study

ESCAIDE reference number: 20110344

VECTOR BORNE DISEASE

Post-epidemic seroprevalence in the epicentre of a West Nile virus outbreak in Central Macedonia, Greece, 2010

Georgia Ladbury (1, 2), M. Gavana (4), K. Danis (3), T. Stardeli (4), A. Panos (4), M. Dragasaki (4), S. Giannakopoulos (4), F. Goma (3), M. Keramarou (2, 5), M. Moirasgenti (4), G. Theocharopoulos (3), E. Tsantaki (4), A. Vakfari (4), E. Vouzounerakis (4)

AFFILIATIONS:

1. Centre for Infectious Disease Control, National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
3. Hellenic National Centre for Disease Prevention and Control (KEELPNO), Athens, Greece
4. Aristotle University of Thessaloniki, Thessaloniki, Greece
5. Communicable Disease Surveillance Centre, Public Health Wales, UK
6. National School of Public Health (ESDY), Athens, Greece
7. European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
8. Ecodevelopment, Thessaloniki, Greece

BACKGROUND:

During the summer of 2010, 262 cases including 35 deaths from West Nile virus infection were reported from Central Macedonia, Greece. We conducted a seroprevalence study in the outbreak epicentre to determine post-epidemic seroprevalence and identify risk factors for infection.

METHODS:

Sixty clusters of six households were randomly selected from the Pella and Imathia districts in Central Macedonia. All household members aged ≥18 years were eligible to participate. Information on individual- and household-level exposures was gathered using standard questionnaires. Sera were tested for WNV-specific IgM and IgG using ELISA. The relationships between exposures and IgG seropositivity were explored using crude prevalence ratios and binomial regression, weighting exposures and outcome by age and town size and adjusting for cluster design.

RESULTS:

Overall, 723 (69.3%) of 1043 individuals participated, of whom 644 provided sera. Fifteen samples were IgM positive (weighted seroprevalence 1.9% [95% CI: 1.0-3.5]); these were all additionally IgG positive. In total, 41 samples were IgG positive (weighted seroprevalence 5.8% [95% CI: 3.8-8.6]), all of which had high titres indicating recent infection. Factors associated with IgG positivity included living in a rural area [adjusted prevalence ratio (aPR)=8.18, [95% CI: 1.14-58.72]; being a housewife [aPR=4.30, 95% CI: 2.18-8.46]; being retired [aPR=2.60, 95% CI: 1.38-4.90]; having water repositories on one's property [aPR=2.67-1.42-5.00]; and agricultural labour [aPR=2.93, CI: 1.34-6.40].

CONCLUSIONS:

This survey demonstrates that WNV transmission in the outbreak epicentre was widespread, particularly in rural areas. The risk groups identified may reflect increased exposure to mosquitoes. General interventions, such as health education and mosquito control, with particular attention to these groups may contribute to the prevention of human WNV infections during future periods of WNV activity in this area.

PRESENTED BY: MISS GEORGIA LADBURY

Keywords: West Nile virus; seroepidemiologic studies; cluster

ESCAIDE reference number: 20110058

PARALLEL SESSION ABSTRACTS

VECTOR BORNE DISEASE

Predictors for diagnosis of Tick-borne Encephalitis infection in Poland, 2009–2010

Anna Zielicka-Hardy (1, 2), M. Rosińska (2), M. Kondrusik (3), M. Hlebowicz (4), R. Konior (5), P. Stefanoff (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Department of Epidemiology, National Institute of Public Health-National Institute of Hygiene, Warsaw, Poland
3. Department of Infectious Disease and Neuroinfections, Białystok Medical University, Poland
4. Department of Infectious Diseases, Gdańsk Medical University, Poland
5. Department of Neuroinfection and pediatric neurology, Jana Pawła II Hospital, Kraków, Poland

BACKGROUND:

Tick-borne encephalitis (TBE) is endemic in Poland. Currently, no formal algorithms to diagnose TBE are available, resulting in sub-optimal recognition of the disease. We aimed at identifying factors predicting TBE diagnosis among suspected central nervous system (CNS) infections to develop a diagnostic algorithm for physicians' usage.

METHODS:

We conducted a case-control study in 11 Polish voivodships between 2009/2010. Cases were patients admitted to selected hospitals, who, based on clinical or laboratory findings, were assigned an ICD code indicating aseptic meningitis or encephalitis, and confirmed as TBE-positive through serology (IgG and IgM). Controls were patients with aseptic CNS infection who tested negative at serology for TBE. We used logistic regression to calculate odds ratios (OR) and 95% confidence intervals (CI).

RESULTS:

Of the 598 patients tested for TBE, 163 (27.3%) tested positive. TBE patients were more likely to: be 40–59 years, compared to <19 years (OR 5.20; 95% CI 1.99–13.6), report fever above 39°C (OR 14.4; 95% CI 3.78–55.1), a tick bite (OR 7.23; 95% CI 3.38–15.4) and be symptomatic between April–November (OR 12.6; 95% CI 1.5–103.6), compared with controls. Living in a TBE endemic area did not play a significant role (OR 1.30, 95% CI 0.65–2.61).

CONCLUSIONS:

This is the first study in Poland highlighting possible predictors for TBE diagnosis. Physicians should consider TBE for patients: 40–59 years of age, during TBE season, who report fever or tick bite. The lack of effect of endemic area on the likelihood of TBE diagnosis could indicate misclassification of non-endemic areas due to their infrequent testing. Promotion of testing in non-endemic areas should be considered. The proposed algorithm may be of use in other countries, should the model be validated elsewhere.

PRESENTED BY: MRS ANNA ZIELICKA-HARDY

Keywords: Tick-borne encephalitis, algorithm, diagnosis, Poland

ESCAIDE reference number: 20110190

VECTOR BORNE DISEASE

West Nile Virus circulation in north-eastern Italy, August–September 2011

Guido Di Martino (1), T. Patregnani (1), G. Capelli (1), P. Mulatti (1), M. Lorenzetto (1), C. Terregino (1), F. Russo (2), G. Cester (2), M. Brichese (2), M. Palei (3), T. Gallo (3), G. Savini (4), L. Bonfanti (1), S. Marangon (1)

AFFILIATIONS:

1. Istituto Zooprofilattico Sperimentale delle Venezie, Legnaro (Padova), Italy
2. Regione del Veneto, Venezia, Italy
3. Regione Autonoma, Friuli Venezia Giulia, Trieste, Italy
4. Istituto Zooprofilattico Sperimentale di Abruzzo e Molise, Teramo, Italy.

BACKGROUND:

In 2008 an equine WNV outbreak was detected in north-eastern Italy. Active and passive surveillance was reinforced in this area on equines, wild birds and mosquitoes. In 2009 a Surveillance Area (SA) was defined 20km northward and westward from the Area with WNV Circulation (AWC). In 2010 sentinel equines tested for IgG titres always resulted negative in SA, nevertheless 10 mosquito pools were found positive, 4 syndromic horses and 6 human cases were reported in AWC. In 2011 a new regional plan was implemented for Veneto and Friuli-Venezia-Giulia regions.

METHODS:

From August to September 2011, 764 equine sera from 240 holdings were screened by a commercial IgM capture ELISA. Positive samples were confirmed by virus neutralization, plaque-reduction neutralization assays and IgM ELISA at OIE Reference Centre for WND. Sixty-one CDC-CO2 mosquito traps were distributed in the 11 provinces of the two regions. Collected mosquitoes were identified, pooled by species/date/location and examined by real-time RT-PCR and sequencing. For human cases a notification system was implemented by regional health services.

RESULTS:

IgM seropositive equines were detected in 4 holdings, three in AWC and one in SA. 80,773 mosquitoes of 16 species were collected and 2,394 pools examined. Three *Culex pipiens* pools yielded positive results for WNV. Until September, 6 human cases were confirmed in Veneto.

CONCLUSIONS:

Positive cases detection in AWC indicated WNV re-activation, while positive cases detection in SA showed a WNV northwards spread. Human cases are likely to occur in areas where infected mosquitoes and seropositive equines were found. Entomological monitoring and equine IgM screening revealed to be valuable tools for early detection of WNV circulation, however the former resulted more expensive and time consuming.

PRESENTED BY: DR GUIDO DI MARTINO

Keywords: West Nile virus, surveillance, mosquitoes, IgM, human cases, sentinel equines

ESCAIDE reference number: 20110380

VECTOR BORNE DISEASE

Malaria in Greece, 2011

Kostas Danis (1), A. Baka (1), I. Terzaki (1), G. Dougas (1), M. Detsis (1), E. Papanikolaou (1), S. Gewehr (2), C. Kefaloudi (1), A. Balaska (1), A. Economopoulou (1), S. Tsiodras (1), N. Vakalis (3), S. Bonovas (1), J. Kremastinou (1)

AFFILIATIONS:

1. Hellenic Centre for Disease Control and Prevention, Athens, Greece
2. Ecodevelopment, SA
3. National School of Public Health, Athens, Greece

BACKGROUND:

Greece was declared malaria free by the World Health Organisation in 1974. In 2009 a cluster of eight cases of *P. vivax* was reported from Evrotas, Lakonia in southern Greece. In late May 2011, a new case occurred in the same area. An investigation was initiated in order to identify new cases, to determine the potential source of infection and determine the affected area(s).

METHODS:

Malaria is a notifiable disease in Greece. Malaria cases were interviewed using a questionnaire, gathering information on potential modes of transmission and clinical and detailed travel history. Diagnosis was done by microscopy and all positive samples were confirmed by PCR. Entomological surveys were conducted in identified affected areas.

RESULTS:

By 23/09/2011, 35 cases of *P. vivax* infection were identified in Greece; 19 in Greek citizens. Sixteen cases were in migrant seasonal agricultural workers; 13 from malaria endemic countries. Disease onset ranged from 23/05/2011 to 14/09/2011 with a peak (13 cases) during the first two weeks of September. Twenty-nine cases resided in the small (25km²) agricultural area of the Evrotas delta, Lakonia. The remaining six cases were distributed in agricultural areas in four other districts. A high number of migrant workers from malaria endemic countries reside in all affected areas. The most likely implicated mosquito vector was *Anopheles sacharovi*.

CONCLUSIONS:

Preliminary findings indicate that local transmission of *P. vivax* occurred in 2011 in mainly one de-limited geographical area in Greece. Control measures included increasing awareness among physicians, active case-finding and treatment and intensified vector control. Research on the implicated mosquito vector is needed to better understand the transmission dynamics in Greece and allow targeted control measures.

PRESENTED BY: DR KOSTAS DANIS

Keywords:

ESCAIDE reference number: 20110384

HIV – STI

Risk factors for HIV infection among pregnant women – Tashkent Region, Uzbekistan, 2007–2008

Khabibulla Ashurov

AFFILIATIONS:

Republican AIDS Center, Tashkent, Uzbekistan Central Asia Regional Field Epidemiology Training Program

BACKGROUND:

During 2005–2009 in Uzbekistan, 903 pregnant women (PW) and 249 children aged <two years were reported to be HIV-infected. During 2007–2008, 59,000 PW underwent routine HIV screening in Tashkent Region; we analyzed these data to identify risk factors for HIV and to provide recommendations to reduce the risk of HIV infection among women and their newborn children.

METHODS:

In a case-control study, we enrolled as cases all 205 PW who were positive on ELISA for HIV antibodies and Western blot; 203 randomly selected HIV-negative PW were enrolled as controls. Socio-economic, behavioral, and previous hospitalization data were collected through interviews and medical record review. We used logistic regression to assess the association between risk factors and HIV infection.

RESULTS:

Of the 205 HIV-positive PW, 188 (92%) were married and 55 (27%) had a history of hospitalization. Of the 188 HIV-positive married PW, 90 (48%) had husbands with primary school education and 38 (20%) had husbands who were migratory workers. In multivariate analysis, risk factors for HIV infection were: PW's husband with primary education (OR=3.1, 95% CI=1.4-6.8), history of previous hospitalization (OR=2.9, 95% CI=1.5-5.6), and having a migratory worker husband (OR=2.2, 95% CI=1.0-4.7); alcohol use was not significant (OR=0.9, 95% CI=0.4-2.2). Exposure to health education was protective (OR=0.4, 95% CI=0.2-0.8).

CONCLUSIONS:

While some of the PW might have gotten infected in hospital settings, there was also evidence of possible transmission from husband to wife. We recommend that health education be provided to families, especially if the husbands are migratory workers or with low education. Medical procedures in healthcare settings should be investigated to identify increased risk for HIV in order to enforce appropriate infection control measures.

PRESENTED BY: DR KHABIBULLA ASHUROV

Keywords: HIV, risk factors, pregnant women, case-control study, Uzbekistan

ESCAIDE reference number: 20110047

PARALLEL SESSION ABSTRACTS

HIV – STI

The risk of AIDS-defining events is decreasing over time in the German HIV-1 Seroconverter Cohort

Mathias Altmann (1, 2, 3), an der Heiden M (1), Scheufele R (1), Hartmann K (1), Houareau C (1), Hamouda O (1), Bartmeyer B (1)

AFFILIATIONS:

1. Robert Koch-Institute, Berlin, Germany
2. Postgraduate Training for Applied Epidemiology (PAE, German FETP)
3. European Program for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

BACKGROUND:

Effectiveness of Highly Active Antiretroviral Therapy (HAART) needs to be monitored continuously at the population level. The German HIV-1 Seroconverter Cohort is a multi-centre, open, long-term observational cohort including patients with a known or reliably estimated date of HIV-infection –i.e. last negative and first positive HIV antibody test within a maximum three-year interval or laboratory evidence of seroconversion. Our study aims to investigate survival improvements and changes in AIDS risk over calendar periods in the German HIV-1 Seroconverter Cohort.

METHODS:

Retrospective (for the pre-1997 period) and prospective (since 1997) data from the German HIV-1 Seroconverter Cohort were used. Time from seroconversion to first AIDS-defining event over calendar periods was analysed by using Cox models adjusting for age at seroconversion, sex, transmission groups and short HIV test interval.

RESULTS:

2,162 seroconverters with 7,956 person-years of observation were included in our analysis (up to 31.12.2010). A total of 175 AIDS-defining events were reported. Compared with pre-1997 period, the hazard ratio (HR) of AIDS decreased over time to 0.4 (95% CI 0.2-0.6), 0.3 (0.1-0.4), 0.4 (0.3-0.7) and to 0.2 (0.1-0.3), in 1997–2000, 2001–2004, 2006–2007 and 2007–2010, respectively. Compared with the 1997–2000 period, a second decrease occurred in the 2007–2010 period (HR, 0.5; 95% CI, 0.3-0.9). Independent risk factors for AIDS were age at seroconversion (HR, 1.3 per 10 year-increase) and people with a high prevalence country (HPC) origin (HR, 2.5 compared to men who have sex with men).

CONCLUSIONS:

HAART effectiveness has improved in the German HIV-1-Seroconverter Cohort. The risk to develop AIDS decreased significantly over calendar periods (in 1997–2000 and in 2007–2010). Elderly and people from HPC require particular monitoring in view of their faster progression to AIDS.

PRESENTED BY: DR MATHIAS ALTMANN

Keywords: HIV progression, AIDS-defining event, seroconverter, population effectiveness, HAART

ESCAIDE reference number: 20110130

HIV – STI

Main results and impact analysis of annual Chlamydia screening in a large register-based programme in the Netherlands

CJPA Hoebe, IVF van den Broek, JEAM van Bergen, JSA Fennema, HM Götz, E Over, MAB van der Sande, BV Schmid and ELM, Op de Coul, on behalf of the CSI-Group

AFFILIATIONS:

Department of Infectious Diseases, South Limburg Public Health Service, Geleen, the Netherlands, P.O. Box 2022, 6160 HA Geleen, The Netherlands, christian.hoebe@ggdz.nl Epidemiology & Surveillance Unit, Centre for Infectious Disease Control, National Institute of Public Health and the Environment, Bilthoven, the Netherlands, P.O. Box 1/pb 75, 3720 BA Bilthoven, the Netherlands. ingrid.van.den.broek@rivm.nl STI AIDS Netherlands, Amsterdam, the Netherlands Cluster of Infectious Diseases, Department of Research, Online Research and Prevention Unit, Amsterdam Health Service, Amsterdam, the Netherlands Division of Infectious Disease Control, Rotterdam Rijnmond Public Health Service, Rotterdam, the Netherlands Department of Infectious Diseases, South Limburg Public Health Service, Geleen, the Netherlands Centre for Prevention and Health Services Research, National Institute of Public Health and the Environment, Bilthoven, the Netherlands

BACKGROUND:

Chlamydia screening programmes can only work when they motivate sufficient persons at risk to get tested regularly. Outcomes of the Dutch Chlamydia Screening Implementation (CSI) are novel and valuable: large scale programme (315.000 targeted), systematic (register-based) and three screening rounds.

METHODS:

Chlamydia Screening was offered annually to 16–29-year-olds in three regions. Phased implementation was applied by grouping clusters in three random, risk-stratified blocks. Participation and positivity rates were compared between blocks in 1, 2 or 3 screening rounds. Effect of repeated screening rounds on prevalence of Chlamydia in the whole target group was estimated by weighting procedures comparing demographic characteristics.

RESULTS:

Participation rate in the first round was 16% among all invitees and 20% among the sexually active target population (M13%, F 25%). Participation decreased to 11% in blocks invited 2 times and 10% in 3-times- invited, whereas it was 13% in the control block invited by the end of round 2 only. Positivity rate at the first invite was 4.3%. Positivity rates decreased, albeit non-significantly, to 4.0% in blocks screened twice and to 4.1% in the block screened thrice; in the control block 4.2% tested positive. The population prevalence was estimated at 2.6% in Amsterdam, 3.7% in Rotterdam and 2.7% in South Limburg and no significant declines were seen.

CONCLUSIONS:

Participation in CSI was lower than expected and declined with repeated invitation. Chlamydia positivity rates were hardly reduced after three screening rounds. Only a small and non-significant impact on population prevalence was measured. Further extrapolation of findings in a simulation model suggest a limited impact on Chlamydia prevalence after 10 years of screening and estimates of cost-effectiveness do not support a nationwide roll-out.

PRESENTED BY: DR CHRISTIAN HOEBE

Keywords: Chlamydia screening prevalence impact

ESCAIDE reference number: 20110149

HIV – STI**HIV testing in Northern Ireland, 2000–2010: timeliness of diagnoses and trends in activity by healthcare setting**

G Kuyumdzhieva (1, 2), N Irvine (1), C McCaughey (3), S Quah (4)

AFFILIATIONS:

1. Public Health Agency, Northern Ireland
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Diseases Prevention and Control (ECDC), Sweden
3. Regional Virology Laboratory, Belfast Health and Social Care Trust, Northern Ireland
4. Regional GUM Service, Belfast Health and Social Care Trust, Northern Ireland

BACKGROUND:

UK guidelines advocate access to HIV testing in all healthcare settings, with important individual and public health benefits like early treatment and reduced transmission. We aimed to assess HIV testing activity by healthcare setting in Northern Ireland (NI) and to examine the association between setting and timeliness of first-UK diagnosis to inform further policy development.

METHODS:

We analysed HIV testing trends using information on tests performed by the Regional Virology Laboratory, during 2000–2010, by setting. Enhanced surveillance data on first-diagnoses in NI were matched to laboratory data. The association between CD4 counts <350 cells/mm³ at diagnosis as a proxy for late diagnoses, and healthcare setting was calculated using logistic regression. Adjusted odds ratios (aOR) with their 95% confidence intervals (CI) are presented by age group, gender, country of birth, route of transmission, and time period.

RESULTS:

Between 2000 and 2010 HIV testing activity increased in Genitourinary Medicine (GUM) clinics from 1482 to 14,583, in hospitals from 914 to 8542 and in primary care (PC) from 504 to 1832. Laboratory and enhanced surveillance system data were matched for 71% (396/558) of first diagnoses made in NI, with 49% (195/396) cases having CD4 counts <350 cells/mm³ at diagnosis. Late diagnoses were associated with hospitals (aOR=6.49; 95%CI 3.48-12.10).

CONCLUSIONS:

Despite an increase in HIV testing across all healthcare settings during 2000–2010, the proportion of late diagnosis has remained high in hospital and PC setting. Barriers for testing, especially in primary care, should be explored further and evidence of early testing as an effective intervention should be reinforced in future strategies.

PRESENTED BY: MS GALENA KUYUMDZHIEVA

Keywords: HIV testing activity

ESCAIDE reference number: 20110243

HIV – STI**HIV incidence estimates among men who have sex with men in the UK: a multisystem approach**

Sarika Desai (1), A Brown (1), RD Smith (1), AM Presanis (2), G Hughes (1), V Delpech (1)

AFFILIATIONS:

1. HIV & STI Department, Health Protection Services – Colindale, Health Protection Agency, UK
2. MRC Biostatistics Unit, Cambridge

BACKGROUND:

Estimating HIV incidence, although essential in understanding transmission patterns and monitoring prevention interventions, remains a challenge 30 years into the epidemic. We describe a range of surveillance and statistical methods used to estimate incidence among men who have sex with men (MSM), the group most at risk of HIV in the UK.

METHODS:

Measures indicative of incidence for MSM were derived using: 1) National HIV reporting system 2) Recent HIV infection testing algorithm (RITA) 3) Detailed STI clinic attendances 4) Modification of the MPES prevalence model, an evidence synthesis.

RESULTS:

Five year trend data show an increase in new diagnoses, (2,650 in 2005 to 3,080 in 2010) and in median CD4 count at HIV diagnosis (392 to 421 cells/mm³), while age at diagnosis remained stable at 35 years. Testing new diagnoses with RITA suggested that a quarter of newly diagnosed MSM in 2010 acquired their infection 4–5 months prior diagnosis. Seroconversion rates among STI clinic attendees with a documented HIV negative test was 2.2/100 person-years (2008–9). The MPES model suggests an increase in population incidence of MSM from 0.5% (credible intervals 0.1%–0.8%) in 2002 to 0.9% (0.5%–1.3%) in 2007.

CONCLUSIONS:

Surveillance and modelling data from the UK provide strong evidence that HIV transmission among MSM is high and likely to be on the increase. Generalisability and limitations of these measures will be further explored.

PRESENTED BY: MS SARIKA DESAI

Keywords: HIV, incidence, UK, MSM

ESCAIDE reference number: 20110281

PARALLEL SESSION ABSTRACTS

TRAVEL AND MASS GATHERING

A practical example for tailoring an event-specific enhanced surveillance – the FIFA Women's World Cup in Germany 2011

Anja Takla (1, 2, 3), E. Velasco (2), J. Benzler (2)

AFFILIATIONS:

1. Postgraduate Training for Applied Epidemiology (PAE), Germany
2. Robert Koch Institute, Surveillance Unit, Berlin, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control, Stockholm, Sweden

BACKGROUND:

Public health authorities are responsible for monitoring infectious diseases during mass gatherings. To decide on an appropriate level of enhanced surveillance, scale of the event, participants' origin, amount of public attention, and degree of disease activity in the host country need to be considered. For the FIFA Men's World Cup 2006, Germany implemented an enhanced surveillance. The scale of the FIFA Women's World Cup (June 26 – July 17, 2011) was estimated to be substantially smaller, though its exact scale was not priorly known. Therefore, we aimed to develop a strategy to tailor an event-specific enhanced surveillance.

METHODS:

Based on the enhanced surveillance measures during the Men's Cup, we created a semi-structured questionnaire for a needs assessment with the local health authorities in the nine host cities in March 2011. Specific measures that a majority of health authorities consented on were implemented. Post-event, we surveyed these health authorities to evaluate the implemented measures.

RESULTS:

All nine health authorities participated in the pre-event needs assessment. Five authorities deemed daily (vs. weekly) infectious disease routine reporting appropriate. Six and eight authorities, respectively, supported receiving feedback on daily-reported data and a summary on national/international, World Cup-relevant epidemiological events, e.g. from participants' countries. Five authorities found the implementation of syndromic surveillance unnecessary. No unusual incidents were reported during the event. Eight of the nine health authorities participated in the final evaluation. The majority perceived the implemented measures as adequate.

CONCLUSIONS:

Based on stakeholder consensus, a low-level enhanced surveillance was implemented, that included mechanisms for rapid upscaling if necessary. Our strategy proved a useful approach to tailoring an event-specific enhanced surveillance that secures ownership and guarantees support of the chosen strategy by all participating stakeholders.

PRESENTED BY: DR ANJA TAKLA

Keywords: Mass gathering, surveillance, survey, football, Germany

ESCAIDE reference number: 20110075

TRAVEL AND MASS GATHERING

Public Health Surveillance during the 2012 Olympic and Paralympic Games

Ellen Heinsbroek (1, 2), M. Catchpole (2), On behalf of the Olympics Surveillance Workstream

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Health Protection Services, Colindale, London, United Kingdom

BACKGROUND:

The influx of international visitors in combination with the mass gathering events during the 2012 London Olympics could increase the risk of public health threats to the UK population. This presentation will outline the Health Protection Agency (HPA) plans to enhance its public health surveillance activities for the Olympics.

METHODS:

Preparations are ongoing according to an "enhanced business as usual" approach, based on core existing systems. In addition, various system changes and new system developments are being implemented to meet needs identified through a review of previous Olympics experience.

RESULTS:

The HPA will produce a daily public health situation report during the Olympic period. Core systems will be enhanced to move from weekly to daily data collection and reporting for surveillance of notifiable diseases; laboratory surveillance; syndromic surveillance; international surveillance; mortality surveillance; and surveillance of chemical, radiation, and environmental hazards. Enhancement will also include the collection of Olympics venue attendance on notification forms. Infectious disease notification will be made compulsory for overseas athletic team doctors. New systems will include: a notification system for the Olympic Village polyclinic; event-based surveillance to identify public health incidents which may significantly impact Olympic venues; and syndromic surveillance based on data from out-of-hours providers and emergency departments. To detect new and emerging disease threats, a surveillance system for cases of undiagnosed serious infectious illness is currently being piloted in sentinel intensive care units in London.

CONCLUSIONS:

Preparations to enhance the HPA surveillance systems for the 2012 Olympics are ongoing, covering a range of activities across the health sector. Exercising and testing of the enhanced surveillance streams and situation report production will take place from August 2011 onwards.

PRESENTED BY: MS ELLEN HEINSBROEK

Keywords: Public Health Surveillance; Olympic Games; Mass gathering; Infectious Diseases; Infectious Disease Reporting

ESCAIDE reference number: 20110141

TRAVEL AND MASS GATHERING

Risk of Travel-associated Legionnaires' disease in Europe

Julien Beauté, B. de Jong, E. Robesyn, D. Ursut and P. Zucs, on behalf of the European Legionnaires' Disease Surveillance Network (ELDSNet)

AFFILIATIONS:

European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

BACKGROUND:

Legionnaires' disease (LD) is an uncommon form of pneumonia due to *Legionella* sp. It is estimated that only 10% of LD cases are notified in Europe with notification rates differing substantially between countries. Of the reported cases, approximately 20% are travel-associated (TALD) with a mortality of 10%. This study is aimed at assessing the risk of TALD in European countries based on travel patterns.

METHODS:

TALD cases and potential sources of exposure were identified through ELDSNet for 2009. Tourism denominator data were obtained from Eurostat for the same year. Since a journey may include several accommodations, we used sites rather than cases in calculations. Risk (number of sites involved / number of nights spent) was calculated by travel country and country of origin. The analysis was limited to European travellers.

RESULTS:

Results: In 2009, the network notified 649 cases possibly associated with 884 accommodation sites in EU countries. France, Italy and Spain accounted for 68.8% of all sites (608/884). The median number of sites per case was 1 (interquartile range 1–2) with a comparable distribution among countries. The overall risk was 0.43 sites /million nights in Europe. The highest risk was found in Italy (0.85) followed by France (0.76) and Greece (0.74). Spain had an average risk of 0.37. On average, the risk for national travellers was twofold lower compared to foreigners. The average risk for Europeans travelling outbound ranged from 0.09 in the UK up to 1.13 in Portugal.

CONCLUSIONS:

To our knowledge, this is the first analysis taking into account travel patterns in assessing risk for TALD. The risk associated with foreign travel destinations showed an increasing trend from Northern to Southern Europe.

PRESENTED BY: DR JULIEN BEAUTÉ

Keywords: Legionnaires' disease; Europe; Surveillance; Travel

ESCAIDE reference number: 20110178

TRAVEL AND MASS GATHERING

Preparations for the London 2012 Olympics – Pilot Study of a Surveillance System for Undiagnosed Serious Infectious Illness (USII)

Ellen Heinsbroek (1), B. Said (2), T. Dallman (3), H. Kirkbride (2), On behalf of the HPA USII Steering Group

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Emerging Infections and Zoonoses Department, Health Protection Services, Colindale, London, UK
3. Laboratory of Gastrointestinal Pathogens, Microbiology Services Division, Colindale, London, UK

BACKGROUND:

The influx of international visitors during the 2012 London Olympics has the potential to increase the risk of introduction of new and emerging infections. These may present as “undiagnosed serious infectious illness” (USII). The purpose of this pilot study was to assess the feasibility of establishing an enhanced surveillance system to detect cases of USII.

METHODS:

The surveillance system was piloted for six months (January-July 2011) at three paediatric and three adult Intensive Care Units (ICUs) in London. A case was defined as “any child or adult admitted to an ICU with a serious illness suggestive of an infectious process where the clinical presentation does not fit with any recognisable clinical picture or there is no clinical improvement in response to standard therapy and initial laboratory investigations for infectious agents are negative.” Clinicians reported cases using an online reporting tool or provided a weekly nil notification. Cases were investigated for epidemiological links, including temporal and spatial clustering.

RESULTS:

In total, 18 cases (5 adult, 13 paediatric) were reported by three ICUs. Sixteen cases were reported within a week after admission to ICU/PICU. Nine paediatric cases were subsequently diagnosed, and thus excluded from the study. The remaining nine undiagnosed cases had presumed sepsis, cardiac and/or respiratory infection. No clustering was identified. One case had travelled abroad, for the other cases no possible exposures were identified. One adult case died, the remainder of cases were discharged without laboratory confirmation of illness.

CONCLUSIONS:

The pilot study indicates this system is feasible and able to detect cases and investigate clusters of USII in a timely manner. Based on these results, the system is being rolled out across London and the South East.

PRESENTED BY: MS ELLEN HEINSBROEK

Keywords: Infectious Diseases, Emerging; Sentinel Surveillance; Intensive Care Units; Paediatric Intensive Care Units

ESCAIDE reference number: 20110194

PARALLEL SESSION ABSTRACTS

INFLUENZA

Usefulness of Health Registries when Estimating Vaccine Effectiveness of a Monovalent Vaccine During the 2009 Influenza Pandemic in Norway

Bernardo Guzman-Herrador (1,2), P. Aavitsland (1), B. Feiring B (1), MA. Bergsaker (1), K. Borgen (1)

AFFILIATIONS:

1. Norwegian Institute of Public Health, Oslo, Norway
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

BACKGROUND:

During the 2009–2010 pandemic in Norway, 12 513 laboratory-confirmed cases of pandemic influenza A(H1N1) 2009, were reported to the Norwegian Surveillance System for Communicable Diseases (MSIS). 2.2 million people (45% of the population) were vaccinated with a monovalent vaccine during the pandemic and registered in the Norwegian Immunisation Registry (SYSVAK). We aimed at estimating the vaccine effectiveness (VE) and describing vaccine failures during the pandemic in Norway, in order to evaluate the role of the vaccine as a prevention measure during the pandemic.

METHODS:

We conducted a population-based retrospective cohort study, linking MSIS and SYSVAK with pandemic influenza vaccination as exposure and laboratory-confirmed pandemic influenza as outcome. We measured VE by week and defined two thresholds for immunity; 8 and 15 days after vaccination

RESULTS:

The weekly VE ranged from 61% to 96%. Overall, 157 individuals contracted pandemic influenza eight or more days after vaccination (8.4/100,000 vaccinated), of these 58 had onset 15 days or more after vaccination (3.0/100,000 vaccinated). More than 30% of the vaccine failures were found in people below 10 years. This was also the age group with the largest increase in vaccine failures when moving the immunity threshold from 15 to 8 days: 19 cases (5.3/100,000 vaccinated) and 65 cases (18.2/100,000), respectively.

CONCLUSIONS:

We estimated VE using two pre-existing national health registries. VE was high regardless of the immunity threshold chosen. However, young children seemed to be less protected by the vaccine and to need more time to develop immunity, which may indicate need for specific preventative measures. Further studies should take into account potential confounding factors, such as underlying diseases among vaccine failures.

PRESENTED BY: MR BERNARDO GUZMÁN-HERRADOR

Keywords: Pandemic, influenza, vaccination, effectiveness, failure

ESCAIDE reference number: 20110037

INFLUENZA

Contribution of influenza A (H1N1) 2009 seroepidemiology to influenza vaccine policy in France 2011: results of a national serological study of blood donors

Angie Bone (1, 2), Jean-Paul Guthmann (1), Azzedine Assal (3), Dominique Rousset (4), Armelle Degeorges (3), Pascal Morel (3), Martine Valette (5), Vincent Enouf (4), Eric Jacquot (3), Bertrand Pelletier (3), Yann Le Strat (1), Josiane Pillonel (1), Laur

AFFILIATIONS:

1. Institut de Veille Sanitaire, St Maurice, France
2. EPIET, European Programme for Intervention Epidemiology, ECDC, Stockholm
3. Etablissement Français du Sang, La Plaine Saint Denis, France
4. Institut Pasteur, Unit of Molecular Genetics of RNA viruses, National Influenza Center (Northern-France), Department of Virology, F-75015, Paris, France
5. Centre national de référence du virus influenzae (région Sud), Lyon, Groupement Hospitalier Est, Hospices Civils de Lyon & EMR Virpath, UCB Lyon1, Université de Lyon, France
6. Centre National de la Recherche Scientifique, URA3015, F-75015, Paris, France
7. Université Paris Diderot, Sorbonne Paris Cité, F-75015, Paris, France

BACKGROUND:

To estimate the future impact of influenza A (H1N1) 2009 (H1N1pdm09) and implement appropriate response strategies, knowledge of the age-specific prevalence of seroprotection and incidence of seroconversion infection is necessary to complement clinical surveillance data and statistical models. We estimated the prevalence of protective levels of H1N1pdm09 antibodies in the French adult population before and after the 2009/10 pandemic, and the proportion that seroconverted due to infection.

METHODS:

With a cross-sectional design and two-stage sampling, stratified by region and type of blood collection site, plasma and information on H1N1pdm09 vaccination and influenza-like illness were collected from 1934 donors aged 20–70 years in mainland France in June 2010. Plasma stored prior to April 2009 was retrieved for each participant. Antibody titres were measured using Haemagglutination inhibition (HI) assays, with seroprotection defined as an HI titre ≥ 40 . Age-specific prevalences of seroprotection before and after the 2009/10 pandemic were calculated, as well as the proportion of susceptibles seroconverting due to infection (4-fold increase in titre in the absence of vaccination or pre-existing seroprotection).

RESULTS:

Seroprotection before the pandemic was 6.1% (95% CI 4.6–8.0) with no differences by age-group ($p=0.2$). Post-pandemic seroprotection was 21.9% (95% CI 17.3–27.3) overall with a greater proportion of 20–29 year olds (43.27%, 26.8–61.4) having seroprotection than older groups ($p<0.001$). Seroconversion due to infection was 11.4% (95% CI 6.7–18.7) overall.

CONCLUSIONS:

About 20% of the French mainland population aged 20–70 had protective levels of antibodies a few months before the 2010/2011 winter season – less than expected from previous modelling. However, serology may underestimate protection as it cannot account for cell-mediated immunity. Nevertheless, our findings contributed to an extension of target groups for influenza vaccination in 2011.

PRESENTED BY: DR ANGIE BONE

Keywords: Influenza A Virus, pandemic H1N1; Seroepidemiologic Studies; Blood Donors; Cross-Sectional Studies; France

ESCAIDE reference number: 20110074

INFLUENZA

Surveillance of Hospitalised Severe Cases of Influenza A(H1N1) 2009 and Related Fatalities during the 2009 Influenza Pandemic in Ten EU Countries.

René Snacken, I. Devaux, F. Plata, E. Broberg, P. Zucs, A. Amato-Gauci

AFFILIATIONS:

Surveillance and Response Support Unit, European Centre for Disease Prevention and Control (ECDC), Stockholm

BACKGROUND:

With the emergence of the influenza A(H1N1) 2009 pandemic, the monitoring of severe influenza cases in hospital settings was implemented for the first time by ten EU Member States.

METHODS:

Case-based data on severe influenza A(H1N1) 2009 cases and related fatalities using a sentinel hospital-based network were uploaded weekly to The European Surveillance System (TESSy) of ECDC, using an online data entry wizard or a file upload function.

RESULTS:

From week 36/2009 to week 20/2010, 9476 cases laboratory-confirmed for influenza A(H1N1) 2009 virus and 571 related fatalities were reported by ten EU countries. The median age of these severe influenza cases was 24 years and the notification rate decreased with age, from 21.6/100.000 in children below one year to 1.4/100.000 in persons aged 75 years and above. Among severe influenza patients reported to have been admitted to ICU in six countries, 88.9% were less than 65 years old and 17.8% of them died. Overall, severe outcome was particularly more frequent in older age groups, especially in males and in the presence of underlying conditions. As observed during previous influenza pandemics, pregnant women frequently suffered from complications: 83 (41.5%) of 200 were admitted to ICU and ten of them died. The crude case-fatality ratio in severe influenza patients was 6.2% and 77.2% of total deaths occurred in those below 65 years of age.

CONCLUSIONS:

Despite important limitations related to lacking representativeness and differences in reporting systems, this monitoring of severe influenza infections implemented for the first time provided useful data at EU level allowing to better characterise risk groups of patients infected by influenza A(H1N1) 2009 virus.

PRESENTED BY: DR RENÉ SNACKEN

Keywords: Influenza, Surveillance, SARI, Pandemic, Severity

ESCAIDE reference number: 20110124

INFLUENZA

Influenza vaccine effectiveness in Europe, 2010–11: estimates from the I-MOVE multicentre case-control study by age group, influenza subtype and among target groups for vaccination

Esther Kissling (1), M. Valenciano (1), JM Cohen (2), B. Oroszi (3), AS Barret (4, 5), C. Rizzo (6), I. Paradowska-Stankiewicz (7), B. Nunes (8), D. Pitigoi (9, 10), A. Larrauri (11), S. Jiménez Jorge (11), I. Daviaud (2), JK Horváth (3), J. O'Donnell (4)

AFFILIATIONS:

1. EpiConcept, Paris, France; 2. GROG/Open Rome, Paris, France; 3. National Center for Epidemiology, Budapest, Hungary; 4. Health Protection Surveillance Centre, Dublin, Ireland 5. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control, Stockholm, Sweden; 6. National Centre for Epidemiology, Surveillance and Health Promotion, Istituto Superiore di Sanità, Roma, Italy; 7. National Institute for Public Health, Warsaw, Poland; 8. Instituto Nacional de Saúde Dr Ricardo Jorge, Lisbon, Portugal; 9. Cantacuzino Institute, National Institute of Research – Development for Microbiology and Immunology, Bucharest, Romania; 10. Universitatea de Medicina si Farmacie Carol Davila, Bucharest, Romania; 11. National Centre for Epidemiology, Instituto de Salud Carlos III, Madrid, Spain; 12. European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden.

BACKGROUND:

In the third season of I-MOVE (Influenza Monitoring Vaccine Effectiveness in Europe), we undertook a multicentre case-control study based on sentinel practitioner surveillance networks in eight European Union (EU) member states to estimate 2010/11 influenza vaccine effectiveness (VE) against medically-attended influenza-like illness (ILI) laboratory-confirmed as influenza.

METHODS:

Using systematic sampling, practitioners swabbed ILI/ARI patients within eight days of symptom onset. We compared influenza-positive to influenza-negative patients among those adhering to the EU ILI case definition. We used multiple imputation with chained equations to estimate missing values. Using logistic regression with study as fixed effect we calculated VE adjusting for potential confounders (age-group, sex, onset week, chronic diseases and related hospitalisations, smoking, previous seasonal and pandemic influenza vaccinations and number of practitioner visits in the previous year).

RESULTS:

Adjusted VE was 52% (95% CI 30-67) overall (N=4410), 55% (95% CI 29-72) against A(H1N1) and 50% (95% CI 14-71) against influenza B. Adjusted VE against all influenza subtypes was 66% (95% CI 15-86), 41% (95% CI -3-66) and 60% (95% CI 17-81) among those aged 0–14, 15–59 and ≥60 respectively. Among target groups for vaccination (N=999), VE was 56% (95% CI 34-71). At one study site VE was lower. Excluding this site, adjusted VE was 75% (95% CI 27-91), 52% (95% CI 12-75) and 63% (95% CI 18-83) among those aged 0–14, 15–59 and ≥60 respectively and 64% (95% CI 44-78) among vaccination target groups.

CONCLUSIONS:

Results suggest moderate protection from 2010–11 trivalent influenza vaccines against medically-attended ILI laboratory-confirmed influenza across Europe. The large sample size of this multi-centre case-control study enables adjusted and stratified VE estimates. I-MOVE shows how a network can provide timely precise summary VE measures across Europe.

PRESENTED BY: MS ESTHER KISSLING

Keywords: Influenza, Influenza vaccine, prevention & control, multicentre studies, case control studies

ESCAIDE reference number: 20110197

PARALLEL SESSION ABSTRACTS

INFLUENZA

Establishing a systematic virological influenza sentinel – challenges and opportunities

Beatrix von Wissmann (1, 2, 3), H. Campe (1), W. Hautmann (1)

AFFILIATIONS:

1. Bavarian Health and Food Safety Authority (LGL), Institute for Health, Oberschleißheim, Germany
2. Postgraduate Training for Applied Epidemiology (PAE, German FETP) Robert Koch Institute, Dept. Infectious Disease Epidemiology, Berlin, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

BACKGROUND:

Emergence of pandemic influenza in 2009 reaffirmed the need for close monitoring of influenza strains circulating in the population. In Bavaria, Germany, paediatricians and general practitioners were recruited to participate in all-year-round virological influenza surveillance, based on submission of respiratory swabs from a systematic sample of patients with influenza-like illness. We evaluated the representativeness of this sentinel in the first post-pandemic influenza season.

METHODS:

Regional representativeness of sentinel surgeries was assessed with respect to the distribution of the underlying population, and the continuity of sample submission between October 2010– April 2011. Virological results were analysed by time and region and compared to the burden of disease as assessed through mandatory influenza notification.

RESULTS:

A total of 141 sentinel surgeries participated. Regional coverage varied between 0.8–1.3 surgeries/100,000 population (median=1.1/100,000). The number of samples submitted for laboratory analysis per week was significantly higher from January–February (median=183, range: 85–232) than outside this peak period (median=59.5, range: 17–148) ($p \leq 0.001$). In total, 39.2% (1063/2712, 95%CI: 37.4–41.1%) of samples were positive for influenza. There were no significant regional differences in proportion of positive samples ($p=0.2$). The highest proportion of positives (59.9%; 95%CI: 53.3–66.3%) was detected in week 6, 2011, coinciding with the peak of reported influenza cases. Pandemic influenza A/H1N1(2009) was the predominant strain, accounting for 83% of positives. A secondary wave of influenza B accounting for 16% of positives was observed between weeks 8–14, 2011.

CONCLUSIONS:

The virological sentinel surveillance successfully reflected increasing levels of influenza activity and tracked changes in circulating viruses in the population over time. Continuity of sample submissions outside the period of influenza peak activity must be strengthened, to allow all-year-round data analysis at regional level.

PRESENTED BY: DR BEATRIX VON WISSMANN

Keywords: Influenza, sentinel surveillance, evaluation, virology

ESCAIDE reference number: 20110245

INTERNATIONAL HEALTH

The impact of the cholera epidemic on the crude mortality rate in Haiti – a retrospective mortality survey in an urban setting, April 2011

Marie-Amélie Degail (1, 2), M. Rondy (3), S. Nicholas (3), J. Boncy (4), R. Pierre (5), A. Munger (6), K. Alberti (3), F. Luquero (3), K. Porten (3)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology (Epiet), European Centre for Disease Control and Prevention, Stockholm, Sweden
2. Health Protection Agency, Colindale, London, United-Kingdom
3. Epicentre, Paris, France
4. Ministère de la Santé Publique et de la Population, Port-au-Prince, Haiti
5. Direction Sanitaire de l'Artibonite (DSA), Ministère de la Santé Publique et de la Population, Gonaïves, Haiti
6. Médecins sans Frontières – France, Port-au-Prince, Haiti

BACKGROUND:

On 21/10/2010, the first case of cholera in over a century was confirmed in Haiti. The population and local healthcare personnel had no knowledge of the disease. On 04/11/2010, Médecins Sans Frontières (MSF) opened a cholera treatment centre (CTC) in Gonaïves. In March 2011, as no data on the cholera related mortality in the community existed, MSF asked Epicentre to assess the crude mortality rate (CMR) during the cholera epidemic in order to adapt future strategy in similar settings. Prior to the 2010 earthquake, the estimated CMR was 0.25/10,000 person/day in Haiti.

METHODS:

In April 2011, we conducted a two stage cluster survey in urban Gonaïves. A diarrhoea case was defined as a person with ≥ 3 watery stools in 24 hours. A household-based questionnaire collected information on structure of the household, watery diarrhoea cases, health seeking behaviour and deaths between 17/10/2010 and survey day (31/03/2011–07/04/2011).

RESULTS:

Data was collected on 18,290 individuals in 3,208 households. The CMR was 0.52/10,000 person/day (95% CI: 0.41–0.66). Watery diarrhoea was the reported cause of 68% of deaths. The watery diarrhoea attack rate during the recall period was 10.8% (95% CI: 9.4–12.2), with a case fatality ratio (CFR) of 5.3% (95% CI: 3.8–6.8). Respondents reported that 65.8% of individuals with watery diarrhoea sought care in a health structure. Attack rates and CFR were higher in areas located away from the MSF-CTC.

CONCLUSIONS:

Our findings suggest that the CMR doubled during the cholera epidemic in Gonaïves, despite a high proportion of cases seeking care. Our results highlight the need for an initial assessment of the possible areas of intervention, in order to target the programme towards those where the population is the most deprived.

PRESENTED BY: MISS MARIE-AMÉLIE DEGAIL

Keywords: Cholera, Haiti, mortality, health care seeking behavior

ESCAIDE reference number: 20110067

INTERNATIONAL HEALTH

Evaluation of Measles Case-Based Surveillance System – Nigeria, 2010

Mohammed Abdulaziz (1), K. Sabitu (2), P. Nguku (1), E. A. Abanida (3)

AFFILIATIONS:

1. Nigeria Field Epidemiology and Laboratory Training Program, Abuja, Nigeria
2. Department of Community Medicine, Ahmadu Bello University, Zaria, Kaduna state, Nigeria
3. National Primary Health Care Development Agency (NPHCDA)

BACKGROUND:

At inception of measles case-based surveillance system in 2005, Nigeria had 98,447 cases of measles and 2,746 deaths, with a case fatality rate in epidemics up to 10%. The objectives of the surveillance included predicting outbreaks through identification of geographic areas and age groups at risk and evaluating vaccination strategies. We described the surveillance system, evaluated attributes and determined whether it was meeting its objectives

METHODS:

We used the CDC updated guidelines for evaluating surveillance. We described the system and stakeholders and evaluated the system attributes. We interviewed 15 national and state surveillance officers (SO) and data from 2006 to 2009 were analyzed

RESULTS:

More than 80% of the SO rated the system as useful, flexible and simple. Majority (62%) rated system as unstable. The requirement of detection of measles specific IgM antibodies for confirmation of diagnosis increased the complexity of the system. The data was of high quality (missing final classification of cases was < 2%). Predictive value positive (PVP) was 29%. The proportion of local government areas taking blood specimen for at-least one suspected case was 86%. Proportion of specimen arriving at the laboratories in good condition was 95%. By 2009 the incidence and mortality of measles had reduced by >90% compared to 2005. Northwest zone of Nigeria had the highest incidence of measles (11–15 cases/100,000/year). Children below 4 years constituted nearly 90% of cases and 71% of them were never vaccinated against measles

CONCLUSIONS:

The system was useful, flexible, representative and of high quality. The surveillance system appears to be achieving some of its objectives but was not stable therefore we recommended decreasing dependency on foreign donors and improve funding of system by government.

PRESENTED BY: DR ABDULAZIZ MOHAMMED

Keywords: Measles, evaluation, surveillance

ESCAIDE reference number: 20110145

INTERNATIONAL HEALTH

Impact of the 2010–2011 cholera epidemic on disadvantaged areas of Cap Haïtien, North Haiti – a retrospective morbidity and mortality survey

Maud Ginsbourger (1, 2), P. Valeh (3), S. Nicholas (3), L. Desvignes (4), J. Boncy (5), K. Alberti (3), F. Luquero (3), K. Porten (3)

AFFILIATIONS:

1. Programme de formation à l'épidémiologie de terrain (PROFET), France
2. Institut de veille sanitaire, France
3. Epicentre, France
4. Médecins sans Frontières – Suisse, Haïti
5. Ministère de la Santé Publique et de la Population, Haïti

BACKGROUND:

A cholera epidemic started in Haiti in October 2010. As no cases had been seen in over a century, the population, including medical staff, was unprepared for the disease. In Cap Haïtien, large city in the northern region, Médecins Sans Frontières (MSF) opened three cholera treatment centres (CTC) in November 2010. In April 2011, MSF and Epicentre conducted a survey in two poor areas of Cap Haïtien (estimated population 18,000) to evaluate the epidemic impact in the community.

METHODS:

We conducted an exhaustive household retrospective morbidity and mortality survey to collect information on household structure, watery diarrhoea cases, health seeking behaviour, and deaths, from 17/10/2010 to survey day. A diarrhoea case was defined as a person with ≥ 3 watery stools in 24 hours.

RESULTS:

The attack rate among the 14,694 surveyed individuals was 13.7% i.e. 8.6/10,000 person/day. Of total cases, 43.5% were reported as severe (loss of consciousness). The case fatality ratio was 8.5%. The crude mortality rate (CMR) was 0.85/10,000 person/day and 90.5% of deaths were reported to be caused by watery diarrhoea. Among all cases, 75.9% reportedly received care, but 34.0% of the fatal cases did not.

CONCLUSIONS:

In these overcrowded areas with poor sanitary conditions, the CMR was three times higher during the recall period compared to the estimated national CMR in 2009 (0.25/10,000 person/day). This difference can largely be explained by reported cholera deaths. Although the care utilisation rate was high, one-third of the fatal cases died without receiving any care. Despite the provision of free health care by MSF structures, access to care remained a barrier for some inhabitants. Early response and easy access to care for the population should be a priority.

PRESENTED BY: MS MAUD GINSBOURGER

Keywords: Haiti, cholera, mortality, survey, disadvantaged area

ESCAIDE reference number: 20110187

PARALLEL SESSION ABSTRACTS

INTERNATIONAL HEALTH

Epidemiology of Cholera in Thailand, 2001–2010

Suchada Juntasiriyakorn, P. Sirirayapon

AFFILIATIONS:

Bureau of Epidemiology, Ministry of Public Health, Thailand

BACKGROUND:

Cholera still poses remarkable threat to health and economic impact if major outbreaks occur. This study aims to describe the distribution and trends of cholera in Thailand and guide prevention and control measures.

METHODS:

A descriptive study was conducted by extracting data from the national surveillance, 2001–2010. Cholera outbreak investigation reports were reviewed. A case was a patient with diarrhea and stool culture positive for *Vibrio cholerae* O1 or O139. Percentages of distribution, median, rate and chi-square tested were used for data analysis.

RESULTS:

Overall, cholera morbidity trend was decreased but large outbreaks emerged every three years, with statistical significant difference (p -value < 0.00001). CFR were mostly less than 1%. Population at risk moves from working age at the outbreaks' commencement to children when it became widespread. Investigation reports suggested seafood as the major source to introduce cholera into remote areas, especially northeast region where raw food consumption is common. Coastal provinces with fishery industry also experience outbreaks often with foreign fishermen were usual initial clusters before spreading to local population if not well control. Inaba was the major serotype in 2001–2005 while change to Ogawa since 2006. Ogawa resists tetracycline, the previous drug of choice. Pulsed field gel electrophoresis of the 2 latest outbreak years revealed the same pattern.

CONCLUSIONS:

Although the overall trend is decreased, major outbreaks still exist with predictable time interval. Socio-cultural changes i.e. increasing migrant workers, mass food production pose challenge to current cholera controlling. In predicted outbreak years, surveillance activities should be strengthened for early detection especially in high risk areas, while improving sanitation and reducing risk behavior are key strategies to improve cholera situation in the long run.

PRESENTED BY: MISS SUCHADA JUNTASIRIYAKORN

Keywords: Cholera, epidemiology, surveillance, Thailand, trend

ESCAIDE reference number: 20110226

INTERNATIONAL HEALTH

Non epidemic cholera cases: risk factors contributing to maintain transmission in Lusaka, Zambia, 2010–2011 cholera season

Grazia M. Caleo (1, 2), Eva Ferreras (3), L. Arend (4), L. Ortiz (4), K. Porten (2), F. Luquero (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden.
2. Epicentre, Paris, France
3. National Centre of Epidemiology, Carlos III Health Institute, Madrid, Spain
4. Médecin Sans Frontières Spain, Barcelona, Spain

BACKGROUND:

Annual cholera outbreaks coinciding with rain season have affected Lusaka, Zambia, in the last years. We implemented an epidemiological study during the first weeks of the expected cholera season of 2011 to assess factors that could trigger the epidemics. However, the expected outbreak did not occur and we investigated risk factors contributing to maintain cholera transmission in a non epidemic scenario.

METHODS:

Assuming a decrease of 2.5 times in the risk of infection ($\alpha=0.05$, power=80%) if free chlorine is present in stored water, the sample size needed for a matched case control study was of 80 cases and 160 controls.

Cases were residents of Lusaka attending Cholera Treatment/Unit Centres (CTCs/CTUs) with acute watery diarrhoea/dehydration, age above five years. Controls were neighbours of the cases, matched by age and sex, without diarrhoea/dehydration but who would access the same CTCs/CTUs if they had. Matched adjusted odds ratio (mAOR) with 95% confidence intervals (CI) were computed in a conditional multivariate model for known cholera risk factors and factors with $p < 0.1$ in the univariate analysis.

RESULTS:

From January-April 2011, 81 cases and 162 controls were enrolled. In the multivariate analysis, close contact with someone with diarrhoea (mAOR=7.4; 95% CI=2.7-19.9), taking water from shallow well (mAOR=2.9; 95% CI=1.0-8.7) and consuming lunch outside home (mAOR=3.0; 95% CI=1.3-7.1) were independently associated with being a case. Hand washing after using the toilet (mAOR=0.4; 95% CI=0.2-0.9) and having a freezer (mAOR=0.2; 95% CI=0.1-0.6) reduced the risk of infection.

CONCLUSIONS:

Several routes of transmission are likely maintaining cholera infection in Lusaka. Reinforcement of classical control measures like use of clean water, education about hand washing, avoid contact with feces of patient along with new strategies (e.g. vaccination) would contribute to reduce cholera transmission.

PRESENTED BY: DR GRAZIA MARTA CALEO

Keywords: Cholera, matched case-controls, risk factors

ESCAIDE reference number: 20110274

MIGRATION AND POPULATION MOVEMENT

Unwanted souvenirs? Trends in Chlamydia incidence among Swedish travellers to different overseas destinations

Valérie Decraene (1, 2), M. Andersson (2), S. Kühlmann-Berenzon (2), I. Velicko (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Department of Analysis and Prevention, Swedish Institute for Communicable Disease Control (SMI), Solna, Sweden

BACKGROUND:

Meaningful interpretation of surveillance data for travel-associated infections is often difficult because we lack reliable denominator data. We analysed surveillance data alongside independent travel data to estimate age and gender-specific Chlamydia incidence among travellers to different overseas destinations in order to better target prevention messages.

METHODS:

The Travel and Tourist database is based on monthly interviews to a sample of the population, which are then extrapolated to the entire Swedish population. For 2000–2010, we calculated annual Chlamydia incidence per 100,000 travels by dividing the number of notified travel-related cases by the number of extrapolated travels. Incidences by age-group and gender, with 95% confidence intervals, were calculated for the top 5 probable countries of infection reported in surveillance data.

RESULTS:

The most commonly reported countries of infection were Thailand, Spain, Norway, the United Kingdom, and Greece. While surveillance data for 2000–2010 showed an increase in cases from Thailand and a decrease from Greece, incidences for both showed stable trends throughout the period. Median Chlamydia incidence among male travellers to Thailand was 103/100,000, 2.3 times higher than among female travellers. Chlamydia incidence among men travelling to Thailand was highest in the 15–24 year group (median: 294/100,000), despite this group having the lowest number of reported cases for each year during the study period.

CONCLUSIONS:

These results show the importance of having reliable denominator data when interpreting surveillance data for travel-associated infections. In Sweden, access to travel data allows us to quantify the incidence of travel-associated diseases and compare sexes, age groups and destinations and follow trends. For Chlamydia, this extra information could allow us to better tailor safe sex messages to target groups travelling to certain destinations.

PRESENTED BY: DR VALERIE DECRAENE

Keywords: Chlamydia, travel, Sweden

ESCAIDE reference number: 20110164

MIGRATION AND POPULATION MOVEMENT

Uptake of health examinations among adult foreign-born TB patients in Stockholm, Sweden, 2011

Filipa Sampaio (1), J. Jonsson (2), F. Hansdotter (2), I. Berggren (3)

AFFILIATIONS:

1. Karolinska Institutet, Stockholm, Sweden
2. Swedish Institute for Communicable Disease Control, Solna, Sweden
3. Department of Infection Disease Control and Prevention, Stockholm, Sweden

BACKGROUND:

TB incidence in Sweden has been rising since 2003 and is related to migration from high-incidence TB countries. By law, asylum-seekers should be offered a health examination (HE) upon arrival in Sweden. These HEs and of relatives arriving <2 years after their family member are reimbursed by the state. In 2009 only 38% of this target group had undergone a HE in Stockholm County. This study explores the uptake of HE in adult foreign-born TB patients in Stockholm County.

METHODS:

The study includes all foreign-born patients aged ≥ 18 years diagnosed with active TB between 1st March 2010 and 1st March 2011 treated at Karolinska Hospital's Infectious Disease Clinics. The patients were asked to complete a questionnaire in Swedish with help of a nurse and interpreter if needed.

RESULTS:

Of 97 eligible patients, 65 answered the questionnaire. Of these, 34% were asylum-seekers/refugees, 26% relatives (<2 years), 17% relatives (>2 years), 15.4% students/workers and 7.7% others. Most cases originated from Somalia (19%), Ethiopia (11%) and Eritrea (11%). Thirty-nine (60%) patients belonged to the HE target group. Only 17 (33.3%) were offered, of which 16 (92%) attended. Of the patients not in the HE target group (n=26), 85% originated from high TB incidence countries. TB was detected through examination of symptoms in 94% of the patients.

CONCLUSIONS:

Despite being a legal requirement and financially reimbursed by the state, the majority of TB patients were not offered a HE upon arrival in Sweden. However, among those offered HE all but one attended. Current policies should be revised and HE offered based on country of origin rather than reason for coming to Sweden not to miss migrants at risk for developing TB.

PRESENTED BY: MISS FILIPA SAMPAIO

Keywords: Tuberculosis, immigrants, health examinations, Sweden

ESCAIDE reference number: 20110166

PARALLEL SESSION ABSTRACTS

MIGRATION AND POPULATION MOVEMENT

Assessment visit to the Greek-Turkish border: public health of migrants, April 2011

Elke Mertens (1, 2, 3), G. Rockenschaub (4), A. Economopoulou (5), P. Kreidl (6)

AFFILIATIONS:

1. Department for Infectious Disease Epidemiology, Federal State Public Health Services Rhineland-Palatinate (LUA), Landau, Germany
2. Postgraduate Training for Applied Epidemiology (PAE, German Field Epidemiology Training Programme), Robert Koch Institute (RKI), Berlin, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
4. Country Emergency Preparedness, World Health Organization (WHO) Regional Office for Europe, Copenhagen, Denmark
5. Project management "Implementation of Health Care and Psychosocial Support Activities for Third Country Nationals that may require international protection in the area of Evros-Greece", Hellenic Centre for Disease Prevention and Control (HCDCP)
6. Surveillance and Response Support Unit, European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

BACKGROUND:

Increased migration to Greece at the Greek-Turkish border led to the implementation of a Migrant Health Care Project (MHCP) in March 2011. Greek health authorities asked a WHO/ECDC team to assess the public health situation in the detention centres for irregular migrants with emphasis on communicable diseases and the main health conditions of the migrants.

METHODS:

Between 5 and 7 April 2011, we visited all detention centres in the region. We conducted semi-structured interviews on occupancy, hygiene conditions, access to food and water (WHO emergency standards) and main health problems with various stakeholders and convenience samples of detained persons.

RESULTS:

A total of 950 persons were detained at the five centres (estimated maximum capacity: 620) prior to the visit. Unlimited drinking water was available and 2–3 meals/person/day were provided. Beds/mattresses and blankets had to be shared by 2–4 persons in two centres; three centres provided only industrial felts. Up to 79 persons had to share two toilets and one shower, lacking soap and detergents. The MHCP provides entry medical examination for all migrants, psychosocial support, vaccination and an oral early warning system but no standardised syndromic surveillance. In interviews police and detainees agreed that MHCP has greatly improved access to health and psychosocial care for migrants. Three persons with tuberculosis (in hospital treatment) and no outbreaks of communicable diseases were reported to the project manager since MHCP commenced operation.

CONCLUSIONS:

The main problems identified in the centres were the very poor basic and hygiene conditions and the overcrowding that increase the risk for communicable diseases. We recommend urgently improving the humanitarian and hygienic conditions, continuing the MHCP and vaccination programme and implementing a syndromic surveillance system.

PRESENTED BY: DR ELKE MERTENS

Keywords: Transients and Migrants; Refugees; Public Health Practice; Health Risk Appraisals; Medical Missions, Official; North Africa, European Union

ESCAIDE reference number: 20110177

MIGRATION AND POPULATION MOVEMENT

The Syndromic Surveillance System for Epidemic Prone Diseases set up following increased migration flows to Italy due to the North Africa Crisis

Flavia Riccardo, Christian Napoli, Antonino Bella, Caterina Rizzo, Maria Cristina Rota, Maria Grazia Dente, Simona De Santis, Silvia Declich

AFFILIATIONS:

Centre for Epidemiology, Surveillance and Health Promotion, Istituto Superiore di Sanità (ISS National Institute of Health), Italy

BACKGROUND:

Following the 2011 North Africa Crisis, Italy witnessed an increased influx of migrants and established a syndromic surveillance system to monitor the health status of this immigrant population.

METHODS:

In order to detect the main epidemic-prone diseases in the region, a daily notification grid of 13 syndromes was prepared. Cases fitting the case definitions are sent daily to the Italian Institute of Health. Statistical alert thresholds were calculated to detect significant differences between the observed and expected incidence of each syndrome. Expected incidence was calculated based on the moving average of the previous week and thresholds (99% CI) were built on the observed incidence using a Poisson distribution. A statistical alert was issued when the expected incidence was outside the confidence interval. An event was investigated whenever alerts were issued on at least two consecutive days (Statistical Alarm).

RESULTS:

From April to June, 71 centres in 13 regions sent notifications. The average weekly population under surveillance was 4,773 persons (range 1,439 to 7,650). 'Respiratory infection with fever' (62%) and 'watery diarrhoea' (28%) were the most commonly reported syndromes. The system produced 43 alerts across all syndromes. Among those, five qualified as alarms. All alarms were triggered for respiratory tract diseases or watery diarrhoea and were found to be due to the arrival of large numbers of people who had suffered very harsh travelling conditions. The number of cases decreased spontaneously within 24–72 hours with no secondary cases. No outbreak response was required.

CONCLUSIONS:

This syndromic surveillance system allowed health providers to monitor the health status of the migrant population that arrived in Italy following the North Africa Crisis and documented that no major health emergencies took place.

PRESENTED BY: DR FLAVIA RICCARDO

Keywords: Syndromic Surveillance, North Africa Crisis

ESCAIDE reference number: 20110293

MIGRATION AND POPULATION MOVEMENT

Tuberculosis case finding based on symptoms screening among irregular immigrants, refugees and asylum seekers in Rome

M. Sanè Schepisi (1), C. Fellus (6), G. Gualano (2), N. Bevilacqua (2), M. Vecchi (2), P. Piselli (1), A. Agresta (1), S. Geraci (3), G. Battagin (2), G. Silvestrini (3), A. Attanasio (3), A. Vela (4), P. Benedetti (5), M. di Marzio (7), M. Maio (7)

AFFILIATIONS:

1. Epidemiology Unit, National Institute for Infectious Diseases (INMI) L. Spallanzani, Rome, Italy;
2. Respiratory Infectious Diseases Unit, INMI L. Spallanzani, Rome, Italy;
3. Area Sanitaria, Caritas Diocesana, Rome, Italy;
4. Ambulatorio Immigrati AUSL RM H, Nettuno (Rome), Italy;
5. Salute per i migranti forzati, centro Astalli, AUSL RM A, Rome, Italy;
6. AUSL RM D, Rome, Italy;
7. AUSL RM B, Rome, Italy;
8. Cittadini del Mondo, Rome, Italy;
9. Medici per i Diritti Umani, Rome, Italy

BACKGROUND:

Tuberculosis (TB) cases in people originating from high-prevalence countries have been increasing in Italy in the last decade. This study was aimed to assess coverage and yield of a TB case-finding program based on symptoms screening conducted at primary care centers and outreach/mobile clinics for irregular immigrants and refugees/asylum seekers.

METHODS:

The presence of symptoms suggestive of active TB was investigated through a standardized questionnaire in all individuals presenting to 3 primary care centers and 3 mobile clinics in Rome, Italy. Symptomatic patients were referred to a specialised outpatient unit for diagnostic workup

RESULTS:

From November 2009 to December 2010, 2142 individuals, were evaluated at primary care centers. Of them, 254 (11.9%) reported symptoms suggestive of TB and an additional 10 patients were referred based on physician's judgement. 101 patients completed diagnostic evaluation (38 % of those referred) and TB was diagnosed in 8 individuals (7.9% of those evaluated, 0.37% of those screened for symptoms). The project is presently being carried out among migrants living in camps in Rome through primary care mobile clinics. Among 701 screened individuals, 48 (6.8%) were symptomatic, 21 (38 % of those referred) completed diagnostic evaluation and 2 (9.5% of those evaluated, 0.28% of those screened for symptoms) were diagnosed with TB.

CONCLUSIONS:

Adherence of symptomatic immigrant to this case finding programs was relatively low (around 40%). Nonetheless, the overall yield of this program is of the same order of magnitude of radiographic screenings performed at entry in low incidence countries. Symptom screening may be a low cost and effective way of promoting early TB diagnosis in migrants.

PRESENTED BY: DR MONICA SANE SCHEPISI

Keywords: Tuberculosis, case finding program, immigrants

ESCAIDE reference number: 20110298

VACCINE UPTAKE/COVERAGE

Impact of immunization practices on the epidemiology of measles, in a village in the South of France, November 2010–January 2011

Laure Meurice (1,2), C. Rousseau (2), M. Grémy (3), B. Broche (3), J. Maurel (3)

AFFILIATIONS:

1. French Field Epidemiology Training Programme (PROFET), French Institute for Public Health Surveillance, Saint-Maurice, France
2. Regional office of the French Institute for Public Health Surveillance, Montpellier, France
3. Languedoc-Roussillon Health Regional Agency, Montpellier, France

BACKGROUND:

From 22/11/2010 to 10/12/2010, seven cases of measles were notified among children of a day-nursery and a school located in a same village in the South of France, suggesting a measles cluster. On 14/12/2010, 29 additional cases had been identified by the local health authorities. An investigation was conducted to confirm the outbreak, describe the transmission and assess vaccination coverage and practices, in order to prevent further spread.

METHODS:

Cases were identified through the interview of the directors of the two affected institutions. Vaccination coverage was assessed through the information provided by the day-nursery's director and from individual health records for the school. General practitioners (GPs) of the district were interviewed by telephone about their awareness of the outbreak, their immunization practices, routinely and during outbreaks.

RESULTS:

On 04/01/2011, 15 cases were reported among the 40 children of the day-nursery (overall attack rate: 37.5%), and 46 cases among the 144 children attending the school (overall attack rate: 31.9%). Vaccination coverage was 48% in the day-nursery and 50% in the school. Seventeen of the 24 GPs of the district answered to the telephone interview: a large majority was aware of the current outbreak (76.5%), properly applied the recommended vaccination schedule (88.2%) and reported the willingness to adapt their practices in case of outbreak (94.1%). One GP declared to be against vaccination: he had his practice in the concerned village and a large number of cases came from his patients.

CONCLUSIONS:

This investigation emphasises the significant risk of measles transmission in an inadequately vaccinated community. It raises the question of the GPs responsibility in term of public health, and highlights the importance of raising the GPs awareness during outbreaks.

PRESENTED BY: MISS LAURE MEURICE

Keywords: Measles, outbreak, vaccination coverage, France

ESCAIDE reference number: 20110118

PARALLEL SESSION ABSTRACTS

VACCINE UPTAKE/COVERAGE

Whom and where are we not vaccinating? Combined use of cluster sampling and LQAS methodologies to guide future campaign strategies for multi-phased introduction of a new conjugate vaccine against group A meningococcus in Niger, 2010

Sunghye Kim (a), Harouna Yacouba (b), Tiekoura Coulibaly (c), Mamoudou H. Djingarey (d), William A. Perea (e), Thomas F. Wierzbza (a), Lorenzo Pezzoli (a, e)

AFFILIATIONS:

1. Translational Research Division, International Vaccine Institute, Seoul, Republic of Korea
2. Ministry of Public Health, Niamey, Niger
3. Niger Country Office, World Health Organization, Niamey, Niger
4. Inter-country Support Team for West Africa, World Health Organization, Ouagadougou, Burkina Faso e. Headquarters, World Health Organization, Geneva, Switzerland

BACKGROUND:

The MenAfriVac is a new conjugate vaccine against *Neisseria meningitidis* serogroup A, the major cause of epidemic meningitis in sub-Saharan Africa. In Niger, the first two phases of the MenAfriVac introduction campaign were conducted targeting 3,135,942 individuals aged 1 to 29 years in the regions of Tillabéri, Niamey, and Dosso, in September and December 2010. We evaluated the campaign and determined which sub-populations or areas had low levels of vaccination coverage in the regions of Tillabéri and Niamey.

METHODS:

After Phase I, conducted in the Filingué district, we estimated coverage using a 30x15 cluster survey (confidence level (CI) 95%, precision 5%, expected coverage 85%) and nested lot quality assurance (LQA) analysis in the clustered samples to identify which subpopulations (defined by age 1–14/15–29 and sex) had vaccination coverage <90% (sample size (N) 30, decision value (d) 5). After Phase II, we used LQA sampling (N=10x10, d=16) to assess if eight districts out of Niamey and Tillabéri had vaccination coverage <90% and aggregated the data to estimate overall coverage.

RESULTS:

Estimated vaccination coverage (as documented by vaccination cards) was 77.4% (95%CI: 84.6–70.2) for Phase I and 81.5% (95%CI: 86.1–77.0) for Phase II. In Filingué, we 'rejected' both the male and female adult (age 15–29) subpopulations for not achieving 90% coverage. After Phase II, we rejected three (one in Tillabéri and two in Niamey) out of eight districts for not reaching 90% coverage.

CONCLUSIONS:

Combined use of LQA and cluster sampling was useful to estimate vaccination coverage and to identify pockets of low coverage. Although overall vaccination coverage was satisfactory, we recommend continuing vaccination in the areas or sub-populations with low coverage and reinforcing the social mobilization of the adult population.

PRESENTED BY: DR SUNGHYE KIM

Keywords: MenAfriVac, Coverage survey, cluster sampling, LQAS

ESCAIDE reference number: 20110211

VACCINE UPTAKE/COVERAGE

HPV vaccination of girls and participation of their mothers in the cervical cancer screening programme in the Netherlands

Anneke Steens (1), CCH Wielders (1), SC de Greeff (1), HC Boshuizen (2), JA Bogaards (1, 3), A van Lier (1), HE de Melker (1)

AFFILIATIONS:

1. Centre for Infectious Disease Control, National Institute for Public Health and the Environment, Bilthoven, the Netherlands
2. Expertise centre for Methodology and Information Services, National Institute for Public Health and the Environment, Bilthoven, the Netherlands
3. Department of Epidemiology and Biostatistics, VU University Medical Centre, Amsterdam, the Netherlands

BACKGROUND:

In the Netherlands, half of the cervical cancer cases are observed among women who don't participate in the national screening program. To further reduce cervical cancer incidence and mortality human papillomavirus (HPV) vaccination has been introduced. To obtain insight in risk factors for non-participation in both prevention programmes, we investigated determinants for vaccination and screening participation. We used screening participation of the mother as proxy of the girl's future screening behaviour.

METHODS:

Via a trusted third party, girl's vaccination status (from the vaccination registry) was matched by house-address with screening participation data of their mothers (from the cervical cancer screening database). We investigated the effect of ethnicity, social economic status (SES), degree of urbanisation and religion on the vaccination and screening participation rates.

RESULTS:

Eighty-nine percent of all invited girls for the vaccination programme (born between 1993–1996; n=337,368) were matched to their potential mother and included in the analysis. Among screened mothers 60% of girls were vaccinated compared to 51% of mothers that did not participate in screening. When using the screening behaviour of the mother as proxy for future screening behaviour of the daughter, only 12% of the girls is expected not to participate in one of both prevention programmes, compared to 23% non-participation when only screening is available. Girls from non-western ethnicities, living in urban areas with low SES or in areas with a high proportion of Christian voters are at risk to be missed in both intervention programs aiming to prevent cervical cancer.

CONCLUSIONS:

These results indicate that a significant part of potential non-screeners can be reached through vaccination, which is important input for studies estimating the overall impact of cervical cancer prevention.

PRESENTED BY: MS ANNEKE STEENS

Keywords: Human Papillomavirus Vaccines, Uterine Cervical Cancer, Mass Screening, Epidemiologic Factors

ESCAIDE reference number: 20110248

VACCINE UPTAKE/COVERAGE

A new model for vaccination coverage data collection from the European Union Member States: a proposal of the VENICE network

Fortunato D'Ancona (1), C. Giambi (1), S. Cotter (2), S. Glissman (3), D. Levy-Bruhl (4), J. Mereckiene (2), P. Stefanoff (5), P. Lopalco (6), L. Demattè (7), V. Cozza (1) (8), E. Appelgren (1), D. O'Flanagan (2), VENICE II gatekeepers group (9)

AFFILIATIONS:

1. Istituto Superiore di Sanità, Rome, Italy,
2. Health Protection Surveillance Centre, Dublin, Ireland,
3. Statum Serum Institute, Copenhagen Denmark,
4. Institut de Veille Sanitaire, Saint-Maurice, France,
5. National Institute of Public Health – National Institute of Hygiene, Warsaw, Poland,
6. European Center for Disease Control, Stockholm, Sweden,
7. CINECA Consortium of University, Bologna, Italy.
8. University of Bari, Bari, Italy (9. http://venice.cineca.org/participating_countries.html)

BACKGROUND:

The VENICE II network, funded by ECDC, collects information on immunisation strategies from all the European Union (EU) Member States (MS), Norway and Iceland through the voluntary collaboration of public health experts in vaccinology identified in each country. In the period 2009–2011 information on strategies against hepatitis B, seasonal and pandemic influenza, HPV, rotavirus, pneumococcus, tick borne encephalitis, pertussis, varicella, measles in high risk groups were collected (http://venice.cineca.org/project_outputs.html), facilitating the circulation and sharing of national experiences. There is a need to improve the evaluation of vaccination strategies at EU level linking vaccine preventable diseases incidence data obtained through the Tessa system with vaccination coverage data (VCD). WHO is collecting national VCD from the European Region, however this collection is completely tuned on MS needs and data show some limitations in terms of quality, comparability and geographical representativeness.

METHODS:

ECDC asked VENICE to develop a consensus document on a model for VCD collection at European level that could overcome the limits of the current collection.

RESULTS:

The proposed system is designed to collect national and subnational data for all vaccinations from multiple birth cohorts, accepting all available data available from a variety of sources. A minimum data set and a format for collection were defined. The system aims to be flexible, collecting what is available in each country without modifying the present routine. The transmission should be web based or through a specific text data format.

CONCLUSIONS:

The document was finalised in June 2011 and a pilot not official implementation is planned in 2011/2012 in Italy, France, Ireland, Great Britain, Germany, Greece, Poland, Denmark. The proposed model should collect comparable VCD and help the harmonisation of European collection systems.

PRESENTED BY: DR FORTUNATO D'ANCONA

Keywords: Immunization/statistics & numerical data, Surveillance, Program Evaluation

ESCAIDE reference number: 20110328

VACCINE UPTAKE/COVERAGE

Exploring the decline in MenC3 and Hib booster vaccination uptake following the 2008 changes in vaccination schedule in Ireland

Javiera Rebolledo (1,2), Sarah Gee (2), Mary Ward (3), Anna Clarke (3), Mary McSweeney (4), Mary O'Meara (5), Brenda Corcoran (5), Gráinne Parker (6), Bernadette O'Connor (6), Heidi Pelly (7), Anita Dillon (7), Suzanne Cotter (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Health Protection Surveillance Centre, Dublin
3. Department of Public Health HSE East, Ireland
4. Department of Public Health HSE South, Ireland
5. HSE National Immunisation Office, Ireland
6. Department of Public Health HSE South-East, Ireland
7. Department of Public Health HSE West, Ireland

BACKGROUND:

In 2008 the revised childhood immunisation schedule was implemented for children born after June 2008. Timing of meningococcal C 3rd dose (MenC3) and Haemophilus influenzae type b booster (HibB) was changed from 6 and 12 months respectively to 13 months. A decline in uptake of those vaccines was reported for the first cohort recommended this schedule. Our objective was to validate local immunisation data and determine reasons for defaulting in order to improve vaccination uptake.

METHODS:

Four of eight Irish regions voluntarily participated. We selected a random sample of children born between July and September 2008 recorded on local immunisation registries as missing MenC3 and/or HibB. We conducted a telephone-based survey among their GPs and parents. We compared registry records against GP records and collected information on immunisation awareness, reasons for defaulting and GP practices.

RESULTS:

We extracted the immunisation records of 116 children. We interviewed 110 GPs (95% participation) and 61 parents (53% participation). According to GP records 24.5% (27/110 95% C.I. 17-33) of children had received MenC3 and/or HibB. Of defaulters, 46.2% (95% C.I. 34-59) of parents believed their children were fully vaccinated. Main reasons reported by parents for defaulting were: lack of awareness of 13 month visit (35.3% 95% C.I. 23-47), illness of the child (34.1% 95% C.I. 22-46), forgot (16.7% 95% C.I. 7-26), objection (9.8% 95% C.I. 2-17). Among defaulters: 55.8% (95% C.I. 43-68) received GP reminders.

CONCLUSIONS:

In this study local immunisation records underestimated immunisation uptake. Most parents of defaulters were unaware their children were incompletely vaccinated. This highlights the need to improve information on vaccination schedule for parents and the important role of GPs to follow-up defaulters.

PRESENTED BY: MISS JAVIERA REBOLLEDO

Keywords: Vaccination, uptake, survey

ESCAIDE reference number: 20110317

PARALLEL SESSION ABSTRACTS

NOVEL METHODOLOGY IN OUTBREAK INVESTIGATION, RISK ASSESSMENT AND COMMUNICATION

Data-driven selection of the phylogenetically informative genomic region for linking outbreaks

Linda Verhoef (1), K. P. Williams (2, 3), A. Kroneman (1), B. Sobral (2), W. van Pelt (1), M. Koopmans (1, 4), on behalf the FoodBorne Viruses in Europe network

AFFILIATIONS:

1. National Institute for Public Health and the Environment, Bilthoven, the Netherlands
2. Virginia Bioinformatics Institute Virginia Tech, Blacksburg, Virginia, USA
3. Sandia National Laboratories, Livermore, California, USA
4. Virology department, Erasmus Medical Centre, Rotterdam, The Netherlands

BACKGROUND:

The recognition of common source outbreaks is supported by finding identical sequences in patients, but internationally often different regions and different lengths of the genome are sequenced. Although harmonization of laboratory methods is a key activity of international networks aiming to identify common source outbreaks, this has proven difficult to accomplish. Here, we aimed to provide a generic method for selection of informative genomic regions for outbreak detection by using a bio-informatics analysis of currently available data on noroviruses from the FBVE-network.

METHODS:

We analyzed 502 unique full capsid gene sequences (~1650 nucleotides) representing the currently known diversity, and including sequences from known linked events (n=52). We evaluated over 3000 maximum likelihood trees each based on a sub-alignment, i.e. alignments of different length and targets taken from the full capsid sequence alignment. For genomic regions of interest we calculated specificity, defined as the ability to cluster known genotypes, variants and outbreak events together but separate from the background diversity. The selection of targets included widely used targets for genotyping. Forty-three maximum likelihood trees were further evaluated through bootstrap analysis.

RESULTS:

Nucleotide positions 900–1400 were best approaching the full capsid gene sequence in its ability to correctly assign genotypes, variants and the outbreaks events used in this analysis simultaneously, with specificities being 100%, 75% and 91%, respectively. Differences were seen in the suitability of commonly used PCR targets for cluster detection, with lower specificities for clustering genotypes (50–100%), variants (33–75%) and outbreak events (36–82%).

CONCLUSIONS:

The analysis can be performed as an evaluation point to guide laboratory efforts in recognizing international outbreaks and harmonizing detection methods, once a large enough dataset of reference sequences of substantial length is available.

PRESENTED BY: DR LINDA VERHOEF

Keywords: Norovirus, molecular sequence data, genomics, infectious diseases, surveillance, outbreaks

ESCAIDE reference number: 20110024

NOVEL METHODOLOGY IN OUTBREAK INVESTIGATION, RISK ASSESSMENT AND COMMUNICATION

Diagnosticat: a disease surveillance system derived from electronic health record data

Ermengol Coma Redon (1), L. Méndez Boo (1), J. Camus Heras (1), E. Hermosilla Pérez (2), Y. Román Morillo (3), M. Medina Peralta (1)

AFFILIATIONS:

1. SISAP, Institut Català de la Salut, Barcelona.
2. Institut d'Investigació en Atenció Primària (IDIAP Jordi Gol), Barcelona.
3. Servei de Medicina Preventiva, Hospital Vall d'Hebron, Barcelona.

BACKGROUND:

In the past years, sentinel networks have been more useful for the surveillance of some diseases than universal reporting of cases systems. However, these sentinel systems also have limitations, which derive from the voluntary participation of physicians, the lack of representativeness, and the low use of case definition. Since 2006, 80% of primary care doctors in Catalonia (Spain) routinely register their activity in eCAP, an electronic health record system. Data produced is a key source of information that could also be used for surveillance of certain diseases.

METHODS:

In 2010 we developed a process of extracting health conditions information from the electronic health record. Initially we focused on influenza diagnosis and the process included all diagnoses recorded in eCAP during the flu season. Nowadays, we provide information about some diseases, available on the internet website Diagnosticat (<http://4.sisap.cat/diagnosticat>). In order to validate the system we compared the epidemic curve obtained by this method with those obtained by the sentinel network using Pearson correlation coefficient (r).

RESULTS:

We published weekly information about all flu cases recorded in eCAP. This information was timely updated the day after every finalized epidemiological week. The comparison of our data with that provided by sentinel network shows that both epidemic curves are highly correlated (r: 0.887; 95%CI: 0.838-0.922) and have the same pattern over several years. In addition, our data is published in a more timely fashion, one week prior to those reported by sentinel network.

CONCLUSIONS:

Reporting of cases from the electronic health record can be a rapid and valid method to determine the trend of certain diseases that could help surveillance of some health conditions.

PRESENTED BY: MR LEONARDO MÉNDEZ BOO

Keywords: Electronic Health Records; Sentinel Surveillance; Influenza, Human; Primary Health Care; Internet

ESCAIDE reference number: 20110143

NOVEL METHODOLOGY IN OUTBREAK INVESTIGATION, RISK ASSESSMENT AND COMMUNICATION

A new risk assessment tool for contact tracing after exposure to infectious diseases in public ground transport

J. Hermes, O. Mohr, S. Schink, M. Askar, T. Eckmanns, G. Poggensee, G. Krause

AFFILIATIONS:

Robert Koch Institute, Berlin, Germany

BACKGROUND:

Contact tracing (CT) after exposure to infectious diseases is resource intensive; however, it remains a key principle in infection prevention and control. Travel in public ground transport (PGT) may put passengers at risk of infection due to long travel times and crowding. Guidelines regarding CT on PGT are lacking. The REACT project ("Response to Emerging infectious disease: Assessment and development of Core capacities and Tools") addresses this policy gap: It designed a "Contact Tracing-Risk Assessment Profile" (CT-RAP) to support risk assessment and decision making by public health officials regarding CT after exposure to infectious diseases on PGT.

METHODS:

Evidence for infectious disease transmission in PGT was compiled by a systematic literature search and complemented by a structured multi-step expert consultation: 1. Selection of exemplary infectious diseases requiring CT in PGT. 2. Selection of pathogen-specific epidemiological criteria (e.g. distance of contact to case) and associated values (e.g. >1meter) that might impact the transmission of infectious diseases. 3. Positioning of values on a bipolar scale according to their relevance for decision making (from high to low indication for CT). Finally, we translated all findings into a disease specific graphical risk assessment tool.

RESULTS:

CT-RAPs for tuberculosis, meningococcal disease and measles were developed, providing an overview of epidemiological criteria, associated values and their relevance for decision making on CT, complemented by disease specific considerations, fact sheets, and the rationale for the selection of epidemiological criteria and values.

CONCLUSIONS:

We present a new approach to translate evidence of varying strength and on diverse conditions into a graphical risk assessment tool. The public health community is invited to make use of the tool and to comment to guide further developments in this field.

PRESENTED BY: DR JULIA HERMES

Keywords: Contact tracing, infectious diseases/ control and prevention, epidemiologic methods, risk assessment

ESCAIDE reference number: 20110151

NOVEL METHODOLOGY IN OUTBREAK INVESTIGATION, RISK ASSESSMENT AND COMMUNICATION

Spatiotemporal analysis shows that infection clusters with sheer male dominance are rising incidence of Acute Hepatitis A (AHA) in Italy: a nationwide five-year analysis

Simone Lanini; Paola Scognamiglio; Giuseppe Ippolito; Enrico Girardi

AFFILIATIONS:

National Institute for Infectious Diseases Lazzaro Spallanzani Rome

BACKGROUND:

Recently some AHA clusters among males have been reported in Europe suggesting a major role of intimate contacts between men for transmission. We retrospectively analyzed AHA mandatory reports in Italy in 2005–2009 to identify the occurrence of unrecognized infection clusters which may suggest a change of AHA epidemiology.

METHODS:

Cases of AHA were obtained from the Italian registry of mandatory reports and exposed population from the official census. Infection clusters were identified by spatiotemporal discrete Poisson model adjusted for seasonality. Logistic regression was used to estimate measures of association and temporal trends.

RESULTS:

Between 2005–2009 a 8%/year incidence increasing trend was found ($p < 0.0001$). The increment was due to adult males, in fact, an opposite trend was found between genders and age groups. In particular, dividing the population into 4 risk groups according gender and age, it was found that incidence significantly raised only among adult. In addition while male vs. female RR raised among adults from 2.45 to 4.50 between 2005–2009, the male vs. female RR among children did not change (MH-RR= 1.23; 99%CI 1.07-1.42; p for heterogeneity = 0.7486).

Temporal analysis stratified on the 20 Italian regions identified 21 clusters. Of them 12, all but one occurred after 2007, showed a sheer male dominance (M:F>2). Remarkably the overall increasing incidence trend disappeared, and both genders showed similar decreasing trends and stable male to female RR if clusters with M:F>2 were removed from the analysis.

CONCLUSIONS:

This analysis indicate that between 2005–2009 a relevant number of clusters played a pivotal role to sustain AHA endemicity in Italy. The sheer male dominance within most of these clusters and the overall high male-to-female ratio, suggest that a series of AHA outbreaks may have occurred as a consequence of same sex intercourses between men. A vaccine strategy targeted to gay men may avert local outbreaks and revert the national incidence trend.

PRESENTED BY: DR SIMONE LANINI

Keywords: Hepatitis A; Italy; Population Surveillance; Mandatory Reporting; Disease Outbreaks; Sex Ratio

ESCAIDE reference number: 20110188

PARALLEL SESSION ABSTRACTS

NOVEL METHODOLOGY IN OUTBREAK INVESTIGATION, RISK ASSESSMENT AND COMMUNICATION

FEMwiki – what promotional strategies enable an active online network of field epidemiologists?

Vladimir Prikazsky (1), Arnold Bosman (1), Patty Kostkova (2), Martin Szomszor (2), Hammond, Simon (2)

AFFILIATIONS:

1. European Centre for Disease Prevention and Control, Stockholm, Sweden
2. City ehealth Research Centre (CeRC) of the School of Community and Health Sciences (SC&HS), London, UK

BACKGROUND:

The Field Epidemiology Manual wiki (www.femwiki.com) is an online training resource developed to support the European Programme for Intervention Epidemiology Training (EPIET) that is updated and reviewed by experts in Europe. The social web features enable those interested in epidemiology to present their profiles, expertise and discuss topical matters in online forums. The portal has been evaluated in terms of traffic, registrations, returning users and contribution to content and discussions. In particular, we evaluate the success of promotion through a variety of online media including Facebook and Twitter.

METHODS:

Web server logs, Google Analytics and application data are analysed to evaluate usage patterns since the launch of the site at ESCAIDE 2010. Visitors to the site from each promotional channel are recorded separately along with the number of people that subsequently create accounts on the site.

RESULTS:

598 individuals have registered since the launch in 2010 and over 140 pages of content have been added to the manual. From May until June 2011, 7,231 unique visitors loaded 27,642 web pages with 75% of them were visiting the site for the first time. The launch at ESCAIDE 2010 (held over 3 days) encouraged 113 new users to register. However, only 7 subsequently returned to the site after the conference. A direct email to individuals that expressed interest before the launch yielded 75 new registrations (out of 213 contacts). Promotion via Facebook has generated 5 new registrations (from 25 'likes'), and Twitter has resulted in one new registration (from 171 'follows').

CONCLUSIONS:

Online promotion can be effective but different promotional platforms show varying degrees of engagement. We will present the portal activity, ongoing usage and future plans at the conference.

PRESENTED BY: MR VLADIMIR PRIKAZSKY

Keywords: Epidemiology, training, e-learning

ESCAIDE reference number: 20110271

FROM OUTBREAK INVESTIGATION TO POLICY CHANGES

Risk factors for delayed start of tuberculosis treatment in the South West Region of England, 2008–2010

Alma Tostmann (1, 2), Michelle E. Kruijshaar (3), Elizabeth Tempest (1), Bharat Pankhania (4), Isabel Oliver (1, 5)

AFFILIATIONS:

1. South West Regional Office, Health Protection Agency, Gloucester, United Kingdom.
2. European Programme for Intervention Epidemiology Training, European Centre for Disease Control, Stockholm, Sweden.
3. Tuberculosis Section, Health Protection Services Colindale, Health Protection Agency, London, United Kingdom.
4. South West North Health Protection Unit, Health Protection Agency, Gloucester, United Kingdom.
5. University of Bristol, Bristol, United Kingdom

BACKGROUND:

Timely diagnosis and treatment are essential to reduce tuberculosis transmission. We aimed to identify risk factors for patient and healthcare delay in order to target public health interventions that could minimise the delay in starting tuberculosis treatment.

METHODS:

We analysed Enhanced Tuberculosis Surveillance data of all adult tuberculosis patients reported in the South West Region of England between November 2008 and June 2010. Patient delay was defined as time between symptom onset and presentation at a health facility and healthcare delay as time between presentation and start of treatment. Risk factors were calculated using adjusted hazard ratios (aHR). A hazard ratio < 1 indicates a longer delay.

RESULTS:

The 320 patients included in the study had a median age of 40 years, 56% were male. Two hundred and five patients (64%) had pulmonary tuberculosis, 48 of them were sputum smear negative. Median patient delay was 52 days (IQR 24–101 days). Patient delay was longer in those without a previous history of tuberculosis (aHR 0.45; 95% CI 0.26–0.76). Median healthcare delay was 24 days (IQR 7–60 days). Patients with sputum smear negative pulmonary tuberculosis (aHR 0.45; 95% CI 0.29–0.69), extrapulmonary tuberculosis (aHR 0.43; 95% CI 0.31–0.61) or shorter patient delay (aHR 0.76; 95% CI 0.58–1.00) had longer healthcare delay. Ethnicity was not related to patient or healthcare delay.

CONCLUSIONS:

A substantial proportion of tuberculosis patients had long delays between the onset of symptoms and start of treatment. Public education on signs and symptoms of tuberculosis may reduce long patient delays. Using rapid diagnostic tools for diagnosing smear negative pulmonary tuberculosis and extrapulmonary tuberculosis may reduce healthcare delay in those subgroups of patients.

PRESENTED BY: MRS ALMA TOSTMANN

Keywords: Patient and healthcare delay

ESCAIDE reference number: 20110009

FROM OUTBREAK INVESTIGATION TO POLICY CHANGES

Incidence of acute, symptomatic hepatitis B in the United States, 2005–2010

M Klevens, K Iqbal, E Rizzo, K Gerard, C Vonderwahl, K Sweet, K Bornschlegel, A Thomas, T Bryant, M Kainer, and R Jiles

AFFILIATIONS:

US Centers for Disease Control and Prevention and the Public Health Departments in: New York State, Connecticut, Colorado, Minnesota, New York City, Oregon, New Mexico, and Tennessee

BACKGROUND:

Surveillance of acute, symptomatic hepatitis B virus (HBV) infection can guide vaccination efforts, especially among persons born before universal vaccination (1991).

METHODS:

Emerging Infections Program sites in CO, CT, MN, NM, OR, TN, NYC, and 34 counties in NY state conducted enhanced, population-based surveillance (estimated 45.1 million persons) for HBV infection from 2005–2010. Cases met clinical (acute illness with discrete onset of viral hepatitis symptoms and either jaundice or elevated serum aminotransferases) and laboratory (a positive IgM antibody to hepatitis B core antigen or a positive hepatitis B surface antigen) criteria. Standardized demographic, clinical, and risk factor/exposure data were collected, including ever receiving ≥ 1 dose of HBV vaccine. We calculated the rate of newly reported cases in the population and characterized unvaccinated cases during 2005–2010.

RESULTS:

Overall 2,833 acute, symptomatic HBV cases were reported to participating sites. The overall incidence declined 33% from 1.5 cases per 100,000 population in 2005 to 1.0 / 100,000 in 2010. Of the 2,833 cases, 165 (5.9%) had ever received ≥ 1 dose of HBV vaccine, 1,500 (53.0%) reported no vaccination, and 1,167 (41.2%) had missing or unknown vaccination status. Of the 1,500 reporting no vaccination, 995 (66.3%) were male and 1160 (77.3%) had ≥ 1 risk factor. Risk factor/exposures during the 6 months prior to onset of symptoms, and most frequently reported by unvaccinated cases included: having ≥ 2 sex partners (455;30.3%), hospitalization (231;15.4%), incarceration (193; 12.9%), and injection drug use (176;11.7%). The median age increased significantly from 39 years in 2005 to 44 years in 2010 (test for linear trend $p < 0.01$).

CONCLUSIONS:

Incidence of hepatitis B declined in participating US sites from 2005–2010. Surveillance data can help guide prevention and identify populations that should be targeted for vaccination.

PRESENTED BY: DR MONINA KLEVENS

Keywords: Hepatitis B virus infection; incidence; surveillance; prevention

ESCAIDE reference number: 20110057

FROM OUTBREAK INVESTIGATION TO POLICY CHANGES

Bloodborne virus exposure in healthcare settings in Ireland: review of lookback exercises 1997–2011

Lelia Thornton, S Donohoe

AFFILIATIONS:

HSE Health Protection Surveillance Centre, 25–27 Middle Gardiner St, Dublin 1, Ireland.

BACKGROUND:

Lookback exercises (LBEs) in relation to the bloodborne viruses (BBV), hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV), are resource intensive and cause anxiety for patients. National guidelines were introduced in 1997. A review was undertaken of the nature and outcomes of all such LBEs carried out in Ireland in healthcare settings 1997–2011, in order to inform future policy and practice both nationally and internationally.

METHODS:

A questionnaire was sent to Directors of Public Health and other key informants in the health services and the Ministry of Health to identify all relevant LBEs. Scientific and grey literature was searched for relevant reports. Structured interviews were conducted with the key investigator for each identified LBE and available relevant documentation was examined.

RESULTS:

Ten LBEs were identified; three related to possible exposure to HBV, six to HCV and one to HIV. Nine were in the hospital setting, of which three were in haemodialysis units, and one was in a community setting. The starting point for establishing the LBE was an infected healthcare worker (HCW) in three, a new infection in a patient in five, and deficiencies in local hospital programmes providing blood or blood products in two. Despite testing over 2,000 patients, only one case of BBV transmission was identified by the LBEs. This case did not involve an infected HCW. In-depth initial local investigations of several of the incidents, prior to undertaking the LBEs, had identified seven cases of transmission.

CONCLUSIONS:

The anxiety caused to patients and staff during LBEs must be weighed against the likely benefits. The importance of thorough initial risk assessments and investigations is highlighted.

PRESENTED BY: DR LELIA THORNTON

Keywords: Blood-borne pathogens; exposure; healthcare; transmission

ESCAIDE reference number: 20110296

PARALLEL SESSION ABSTRACTS

FROM OUTBREAK INVESTIGATION TO POLICY CHANGES

Evaluation of the impact of Salmonella control programmes in fowl (*Gallus gallus*) on public health in the EU

Frank Boelaert (1), V. Rizzi (1), P. Makela (1), A. Lahuerta-Marin (2), J. Takkinen (2), A. Ammon (2)

AFFILIATIONS:

1. Biological Monitoring Unit, European Food Safety Authority, Largo Nale Palli, 5/A, I-43121, Parma, Italy
2. European Centre for Disease Prevention and Control, Stockholm, Sweden

BACKGROUND:

Directive 2003/99/EC obligates the EU Member States to collect data on zoonoses and zoonotic agents, and asks EFSA to analyse these data and publish an European Union Summary Report. Human data is analysed and provided by the ECDC.

METHODS:

Eggs are considered to be the most important source of human salmonellosis cases in EU, particularly of those caused by *S. Enteritidis*. In order to evaluate the impact of Salmonella control programmes in fowl on public health, the incidence of human salmonellosis cases caused by *S. Enteritidis*, the numbers of Salmonella food-borne outbreaks caused by eggs and the prevalence of *S. Enteritidis* in laying hen flocks were examined, for the years 2007–2009.

RESULTS:

During 2007–2009, a 43.8 % drop in the notification rate of human *S. Enteritidis* cases per 100,000 population was observed (from 21.0 to 11.8). Correspondingly, a 36 % reduction in outbreaks caused by eggs was reported in EU from 2007 to 2009 (248 to 159 outbreaks). At EU level, the proportion of laying hens flocks infected with *S. Enteritidis* decreased from 3.9% in 2007 to 3.1% in 2008 and 2.9 % in 2009. During the same period the proportion of table eggs positive for *S. Enteritidis* decreased from 0.4 % in 2007 to 0.2 % in 2008 and 2009.

CONCLUSIONS:

The results indicate that the reduction of *S. Enteritidis* in laying hen flocks is likely to have contributed to the decline of *S. Enteritidis* cases in humans, since eggs are regarded to be the most important source of these infections.

PRESENTED BY: MR FRANK BOELAERT

Keywords: Salmonella, salmonellosis, control programme, fowl, EU

ESCAIDE reference number: 20110304

FROM OUTBREAK INVESTIGATION TO POLICY CHANGES

Epidemiology of cholera in Conakry-Guinea: spatial analysis to target interventions

Bertrand Sudre (1, 2), Jessica Dunoyer (3), Sakoba Keita (4), Didier Bazzo (5), Ousmane Balde (6), Diény Fadima Kaba (7), Ousseini Maï Maigana (7), Francois Bellet (8)

AFFILIATIONS:

1. European Centre for Disease Prevention and Control, Sweden
2. UMR-CNRS Chrono-environnement, Université de Franche-comté, France
3. Action contre La Faim International, Spain
4. Ministère de la Santé et de l'hygiène publique, Conakry, République de Guinée
5. Observatoire National de la République de Guinée, Conakry, République de Guinée
6. UNICEF National Office Guinea, Conakry, Guinea
7. UNICEF Regional Office for West and Central Africa, Dakar, Senegal

BACKGROUND:

Cholera epidemics are recurrent in West Africa in urban settings. Seasonal epidemics (2004–2007) have been documented in Conakry (Capital of Guinea) which has a tropical climate and is located on the shore of Guinean Gulf, surrounded by mangroves. Better understanding of the spatial features of outbreaks can guide prevention and response.

METHODS:

Data from cholera treatment centers have been collected and a GIS-database built. Case definition is based on WHO criteria with a set of inclusion and exclusion criteria (age < 5 years, absence/others diagnostic and provenance unknown/external to Conakry). Spatial disease patterns have mapped for the entire outbreak duration. Relationship between the number of weekly cholera cases (WCC) by quarter and geographic features from field survey was modeled using generalized linear model (negative binomial family). Computing and graphical displays were done using MapInfo-10, SaTScan-8.1 and STATA-10.

RESULTS:

After applying the exclusion criteria, 5044 cases were included in analyses (sex ratio = 1.02, mean age = 28 years). The outbreak characteristics were a duration of 30 weeks, an incidence rate of 31/1000 inhab. and a case fatality rate of 1%. Clusters at the start of the epidemic were located in quarters bordering the sea and with commercial harbour as in previous outbreaks. In a multivariate model, geographical determinants significantly associated with WCC were ward with a arm of sea (IRR = 1.32, p=0.04), presence of harbor (IRR = 1.65, p=0.004) and presence of night recreational activities (IRR = 1.98, p=0.001).

CONCLUSIONS:

Knowledge of urban spatial pattern of cholera outbreak have been integrated in National Prevention and Response Plans and targeted prevention actions implemented on community level in high risk areas.

PRESENTED BY: MR BERTRAND SUDRE

Keywords: Outbreaks, Cholera, Vibrio cholerae, prevention & control, Urban Health

ESCAIDE reference number: 20110315

OUTBREAKS 2

Widespread mumps outbreak and effect of supplemental MMR vaccination in a rural district, Thailand, June–October 2010

Manita Phanawadee (1), I. Ieowongjaroen (1), J. Makaroon (1), A. Karnjanapiboonwong (1), N. Henprasertthae (1), P. Smithsuwan (1), S. Juntasiriyakorn (1), H. Kanjanasombut (1), A. Chobkataryoo (1), C. Pittayawonganon (1), M. Sirimart (2), K. Pati (3), R. Lonchakorn

AFFILIATIONS:

1. Field Epidemiology Training Program (FETP), Bureau of Epidemiology, Department of Diseases Control, Nonthaburi, Thailand
2. Nan Provincial Health Office, Thailand
3. Pua District Health Office, Nan, Thailand
4. Pua Crown Prince hospital, Pua district, Nan, Thailand

BACKGROUND:

Thai national expanded program for immunization has provided MMR vaccines to grade-1 students (7 years old) since 1997. A mumps outbreak was detected by a nurse at outpatient department of a district hospital in Nan Province in September 2010. The investigation was initiated by the joint Surveillance and Rapid Response Team to assess the magnitude, secondary attack rate and the necessity for vaccine supplement.

METHODS:

We reviewed medical records of mumps cases and performed active case finding in the village. A suspect case was defined as a resident who developed acute swelling at pre-auricular or submandibular or submental areas or diagnosed mumps with onset from 1 June to 13 October 2010. Cases were confirmed by PCR or ELISA-IgM for mumps. We provided catch-up vaccination with a single dose of MMR vaccine to 2,984 (78%) children aged 1–6 years. A prospective cohort study was conducted to estimate MMR vaccine effectiveness.

RESULTS:

Until 13 October 2010, 129 suspect cases were found in 11/12 sub-districts. Ninety-two (68%) of cases were in children <6 years. Attack rate was highest in kindergarteners (34%). We identified 10 laboratory-confirmed cases: 4 Genotype-J mumps virus and 6 IgM positive. Secondary attack rate was 25% overall and 71% among household members age 1–6 years old. The vaccine effectiveness was estimated to be 65% (95%CI = -55%, 92%).

CONCLUSIONS:

Widespread mumps outbreaks in several sub-districts of Nan Province during June–October 2010, affected mostly children at pre-vaccination age. High coverage of MMR vaccination was effective in reducing mumps virus transmission as the evidence of 7 cases reported after week 5th post-vaccination. The investigation supports the new national guideline for early administration of MMR vaccine at 9-month old.

PRESENTED BY: DR MANITA PHANAWADEE

Keywords: Mumps outbreak, MMR, vaccine effectiveness, Thailand

ESCAIDE reference number: 20110080

OUTBREAKS 2

Gastroenteritis outbreak due to Salmonella Enteritidis following the consumption of wild boar meat in central France

Francisco Nogareda (1,7), P. Beaufils (2), S. Le Hello (3), AL. Thos (2), G. Roy (2), M. Robert (4), E. Thill (5), F. Moury (6), FX. Weill (3), N Jourdan-Da Silva (7)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Cellule de l'Institut de veille sanitaire en région (CIRE) Centre, Orléans, France
3. Institut Pasteur. Centre national de référence (CNR) des Salmonella, Paris, France
4. Délégation Territoriale de l'Indre-et-Loire. Agence Régionale de Santé (ARS) Centre, Tours, France
5. Direction départementale de la protection des populations (DDPP) de l'Indre-et-Loire. Tours, France
6. Laboratoire de sécurité des aliments ANSES, Maisons-Alfort, France
7. Institut de Veille Sanitaire, Saint Maurice, France

BACKGROUND:

In March 2011, the National Salmonella Reference Laboratory reported a cluster of Salmonella enterica serotype Enteritidis (S. Enteritidis) in persons who attended a hunting party in Marigny, France, on 26 February. We conducted an epidemiological investigation to identify the source of infection and implement control and preventive measures.

METHODS:

We conducted a retrospective cohort study. All party participants and those consuming leftovers were interviewed with a standardised questionnaire including information on food items consumption. Probable cases were individuals reporting diarrhoea or vomiting with onset between 27 February and 3 March 2011, and having participated in the meal and/or eating leftovers from this meal. Confirmed cases were stool positive for S. Enteritidis. We calculated attack rates (ARs) and relative risks (RR) with 95% confidence intervals (CIs).

RESULTS:

Among the 75 identified persons, we interviewed 50 (67%) and identified 36 cases (72%), of whom 12 (33%) were confirmed. Food-specific attack rates were similar among exposed and non-exposed persons for all food items except wild boar, for which 72% (34/47) of exposed persons and 0% (0/1) of non-exposed developed illness. All cases consumed wild boar. Five persons ate leftovers from this meal. Among them, four developed illness and all ate wild boar; the non-case only ate blood pudding. No wild boar meat was available for testing.

CONCLUSIONS:

Our results support that this outbreak was caused by contaminated wild boar meat consumption. The isolated serotype is rarely found among wild boars and demonstrates that it is a potential source of S. Enteritidis infection for humans. This outbreak reminds local health authorities to ensure that hunters follow national hygiene regulations and the importance of training hunters on safe handling of game.

PRESENTED BY: MR FRANCISCO NOGAREDA

Keywords: Disease outbreaks, gastroenteritis, Salmonella Enteritidis, cohort study, wild boar

ESCAIDE reference number: 20110176

PARALLEL SESSION ABSTRACTS

OUTBREAKS 2

An outbreak of severe respiratory tract infection caused by human metapneumovirus in a residential care facility for elderly

MJM te Wierik (1), DT Nguyen (2), MFC Beersma (2), S Thijsen (3), KA Heemstra (4)

AFFILIATIONS:

1. Municipal Health Service Midden-Nederland & Utrecht, Zeist/ Utrecht, the Netherlands
2. Department of Virology, Erasmus University Hospital, Rotterdam, the Netherlands
3. Department of Medical Microbiology and Immunology, Diaconessenhuis, Utrecht, the Netherlands
4. Department of Medical Microbiology, University Medical Center Utrecht, Utrecht, the Netherlands

BACKGROUND:

Outbreaks of the recently discovered human metapneumovirus (HMPV) among children are common, but only a few outbreaks among elderly are known. When HMPV was found to be the causative agent of an outbreak of pneumonia in a residential care facility for elderly, an elaborate outbreak investigation was set up, including active surveillance for new clinical cases. Infection control measures such as isolation of ill residents were taken.

METHODS:

A clinical case was defined by fever ($>38^{\circ}\text{C}$) and clinical signs and symptoms of respiratory tract infection. Respiratory samples for viral analysis by RT-PCR from each new clinical case were taken until the outbreak had ended. HMPV-positive cases were periodically sampled until the last respiratory sample tested negative (8 days sampling interval). Finally, all cases were requested to donate one or two blood samples for determination of IgM and IgG titres of HMPV. For residents, an attack rate was calculated.

RESULTS:

In all, 5 staff members and 18 residents fulfilled the clinical case definition. Five residents tested positive for HMPV by RT-PCR. They carried HMPV for at least 9 to 17 days. RT-PCR and serologic results were combined to classify the 23 cases: 9 confirmed cases, 6 probable cases, 6 possible cases, and 2 no cases.

CONCLUSIONS:

The outbreak of HMPV had an attack rate of 5–13% among residents. The outbreak control measures taken seemed effective. Whether the relative long period of viral shedding indicates a prolonged period of transmissibility needs to be studied. Combining results of respiratory analysis with serological results identified retrospectively more probable.

PRESENTED BY: DR MARGREET TE WIERIK

Keywords: HMPV

ESCAIDE reference number: 20110265

OUTBREAKS 2

Hepatitis B outbreak in a nursing home associated with blood glucose monitoring with reusable lancets, Northern Germany 2010

Michaela Diercke (1, 2, 3), M. Monazahian (1), H. Petermann(4), W. H. Gerlich (5), C. G. Schüttler (5), M. Dehnert (2), J. Dreesman (1)

AFFILIATIONS:

1. Governmental Institute of Public Health of Lower Saxony (NLGA), Hannover, Germany
2. Postgraduate Training for Applied Epidemiology (PAE), Robert Koch Institute (RKI), Berlin, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
4. Local Public Health Department, Oldenburg, Germany
5. National Reference Centre for Hepatitis B and D, Justus Liebig University, Giessen, Germany

BACKGROUND:

In September 2010 a cluster of acute Hepatitis B virus (HBV) infections in a nursing home was notified to public health authorities in Lower Saxony. We conducted a retrospective cohort study to identify the route of transmission.

METHODS:

Blood samples of residents were tested for serological markers of HBV infection at NLGA. The national reference laboratory analysed HBV genotypes and sequences. A case was defined as a resident of the nursing home tested positive for Hepatitis B surface antigen (HBsAg) with the outbreak strain in 2010. Information on risk factors as patient care, invasive diagnostic and therapeutical procedures among residents was collected by nursing home staff using a questionnaire. Risk ratios (RR) and 95% confidence intervals (CI) were estimated by Exact Poisson regression.

RESULTS:

Sixty-four residents were included in the study, five of them with acute HBV infection, twelve had a history of HBV infection. The outbreak strain belonged to HBV genotype D2 (subtype ayw3, Ala118) which is not prevalent in Germany but in Eastern European countries. All cases (median age 81) were female, had diabetes, blood glucose monitoring and chiropody. In multivariable analysis only blood glucose monitoring was associated with acute HBV infection (RR=21.97, 95%CI 2.99-∞). Blood glucose monitoring was reported to be done by nursing home staff with patient-based reusable lancets.

CONCLUSIONS:

In nursing home settings the use of single use lancet devices for blood glucose monitoring is strongly recommended to prevent further transmission. We recommended vaccination against Hepatitis B for non-immune staff with contact to known HBsAg-carriers in the nursing home.

PRESENTED BY: MRS MICHAELA DIERCKE

Keywords: Hepatitis B, genotype, disease outbreak, blood glucose monitoring

ESCAIDE reference number: 20110282

OUTBREAKS 2

Outbreak of yersinia enterocolitica O:9 infections associated with bagged salad mix in Norway, February to April 2011

Emily MacDonald (1), B T Heier (1), T Stalheim (2), K S Cudjoe (3), T Skjerdal (3), A Wester (1), B A Lindstedt (1), L Vold (1)

AFFILIATIONS:

1. Norwegian Institute of Public Health, Oslo, Norway
2. Norwegian Food Safety Authority, Oslo, Norway
3. Norwegian Veterinary Institute, Oslo, Norway

BACKGROUND:

Yersinia enterocolitica isolates are routinely bio-, sero- and MLVA-typed by the National Reference Laboratory (NRL) in Norway. On 18 March 2011, the Norwegian Institute of Public Health was notified of five cases of *Y. enterocolitica* O:9 infection with similar MLVA-profiles from geographically disparate areas. Epidemiological and microbiological investigations were initiated to identify the source of the yersiniosis outbreak in order to implement control measures and prevent further spread.

METHODS:

Cases, defined as individuals with laboratory-confirmed *Y. enterocolitica* O:9 infection with the outbreak MLVA-profile in Norway after 1 January 2011, were identified through the NRL. Preliminary results from trawling interviews with seven cases implicated raw vegetables. A case-control study focusing on vegetables was conducted from 30 March 2011 to 4 April 2011. Controls (3:1) matched for age, sex and municipality were drawn from the National Population Registry. Data analysis was performed using STATA. Concurrent food sampling and environmental investigations were conducted.

RESULTS:

We identified 21 laboratory confirmed cases scattered through Norway with symptom onset between 9 February 2011 and 16 March 2011. Cases (n=9) were more likely than controls (n=25) to have eaten bagged salad mix (mOR 13.7; 95% CI 1.6-116.3, p=0.02). Two of 61 food sample analysed (one of bagged salad mix and one of radicchio rosso) were consistently positive by PCR for *Yersinia* spp, but were not serogroup O:9.

CONCLUSIONS:

Following the investigation, bagged salad mixes of a specific brand were voluntarily withdrawn from the market by the producer. No further cases were detected. This is the first outbreak of yersiniosis in Norway to be linked to consumption of vegetables and raises awareness of vegetables as a vehicle for foodborne infections typically associated with consumption of meat.

PRESENTED BY: MS EMILY MACDONALD

Keywords: Disease outbreaks, *Yersinia enterocolitica*, Lettuce, Foodborne diseases

ESCAIDE reference number: 20110311

VACCINE EFFECTIVENESS

Vaccine Effectiveness in a Mumps Outbreak among Primary School Children – Nuremberg, Germany 2011

Anja Takla (1, 2, 3), C. Klinc (4), P. Stöcker (1, 2, 3), N. Kurz (5), A. Schaffer (5), O. Wichmann (2), J. Koch (2)

AFFILIATIONS:

1. Postgraduate Training for Applied Epidemiology (PAE), Germany
2. Robert Koch Institute, Immunization Unit, Berlin, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control, Stockholm, Sweden
4. Bavarian Health and Food Safety Authority (LGL), Institute for Health, Oberschleißheim, Germany
5. Public Health Authorities, Nuremberg, Germany

BACKGROUND:

Mumps infections among two-times measles-mumps-rubella (MMR) vaccinated persons are increasingly observed in industrialized countries. In Germany, mumps is notifiable in 5/16 states. As part of a nationwide active mumps outbreak surveillance, we investigated an outbreak in April/May 2011 in a primary school in Bavaria to determine vaccine effectiveness (VE) among students.

METHODS:

We conducted a retrospective cohort study targeting all students of the five classes that had ≥ one clinically and/or laboratory diagnosed case. Furthermore, we described the vaccination status of all teachers. Via a self-/parent-administered questionnaire we collected information on demography, symptoms, and complications. Additionally, we reviewed vaccination cards. VE was estimated for students as two MMR doses compared to no dose.

RESULTS:

The student response was 93% (100/108). Mean age of the student cohort was 9 years. Eighty-nine (89%) had received two vaccinations, four (4%) were vaccinated once and seven (7%) had not been vaccinated or did not possess a vaccination card. Fourteen cases occurred among students, eight (57%) were male, two developed orchitis, and six (43%) had received two vaccinations. Two-dose VE for students was 91.9% (95%CI 81.0%–96.5%), the average time since last vaccination 5.7 years for cases and 5.3 years for non-cases (p=0.67). Fifteen (56%) of the 27 teachers had received <2 vaccinations. All three cases among teachers were unvaccinated.

CONCLUSIONS:

The majority of students were fully vaccinated with two MMR doses. Our findings are consistent with VE estimates reported from other mumps outbreaks in this age group. Given the estimated VE, a very high two-dose vaccination coverage is required to reach herd immunity and interrupt mumps community transmission. Efforts must be undertaken in Germany to close vaccination gaps among students and teachers.

PRESENTED BY: DR ANJA TAKLA

Keywords: Mumps, outbreak, vaccine effectiveness, cohort study, primary school, Germany

ESCAIDE reference number: 20110192

PARALLEL SESSION ABSTRACTS

VACCINE EFFECTIVENESS

Mumps complications and vaccine effectiveness during a mumps outbreak among mainly vaccinated students in the Netherlands

Ewout Fanoy (1), Jane Whelan (1), Rob van Binnendijk (2), Corien Swaan (3), Hein Boot (2), Hester de Melker (1), Susan Hahné (1)

AFFILIATIONS:

National Institute for Public Health and the Environment (RIVM), the Netherlands

1. Epidemiology & Surveillance Unit (EPI)
2. Laboratory for Infectious Diseases and Perinatal Screening (LIS)
3. Preparedness and Response Unit (LCI)

BACKGROUND:

Despite high MMR vaccination coverage, a mumps genotype G outbreak mainly affecting students, continues in the Netherlands since 2009. To predict the mumps-related disease burden, we investigated the effectiveness of previous MMR vaccination against mumps complications.

METHODS:

Mumps is a notifiable disease in the Netherlands. Notification criteria include clinically suspected mumps and laboratory confirmation of an epidemiological link to a laboratory-confirmed case. Using STATA 11, we analysed mumps notifications between 1 December 2009 and 14 June 2011. We calculated odds ratios and vaccine effectiveness (VE) for any complication and orchitis.

RESULTS:

A total of 958 cases were reported, of whom 16 were hospitalised. No deaths were reported. Vaccination status was confirmed in 68% cases. Of these, 16% were unvaccinated, and 10% and 68% received one and two doses respectively; 6% were vaccinated at least once, but the number of doses was unknown. One or more complications were reported in 8.2% of cases ($n=75/917$) as follows: orchitis ($n=66$, 11.8% of men), pancreatitis ($n=2$, 0.002%), meningitis ($n=2$, 0.002%) and thyroiditis ($n=1$, 0.001%). Among male mumps cases ≥ 12 years of age, vaccination was protective against orchitis. Among all cases, VE against any complication was 67% (95%CI:12-88) and 70% (95%CI:42-84) for 1 and 2 MMR doses respectively, and among male cases VE against orchitis was 66% (95%CI:1-88%) and 74% (95%CI:49-87%) for 1 and 2 MMR doses respectively.

CONCLUSIONS:

Possible explanations for the infections and complications among vaccinated patients include secondary vaccine failure due to waning immunity or a relative mismatch between vaccine and the outbreak strain. Previous MMR vaccination considerably reduces the risk of complications. These findings support the recommendation that unvaccinated persons are encouraged to be vaccinated.

PRESENTED BY: MR EWOUT FANOY

Keywords: Mumps complication vaccine effectiveness MMR

ESCAIDE reference number: 20110200

VACCINE EFFECTIVENESS

Decline of serogroup C meningococcal disease in Portugal after introduction of conjugate meningococcal C vaccine, 2002–2010

H. C. C. de Jonge (Erik) (1, 2), M. J. Simões (3), L. Queiros (4), A. Leça (1), C. de Orta Gomes (1)

AFFILIATIONS:

1. Direção-Geral da Saúde, Lisbon, Portugal
2. European Program for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
3. Instituto Nacional da Saúde Ricardo Jorge, Lisbon, Portugal
4. Administração Regional de Saúde do Norte, Porto, Portugal

BACKGROUND:

Meningococcal C conjugate vaccines were introduced into the Portuguese market in 2002. The vaccine was included in the National Immunisation Program (NIP) in 2006. We analyzed trends in the incidence of invasive meningococcal disease (IMD) in order to evaluate the effect of vaccination and assess possible serogroup replacement.

METHODS:

All laboratory confirmed cases from the Portuguese enhanced surveillance system for invasive meningococcal disease January 1st, 2002 to December 31st, 2010 were included. Annual incidence was calculated for all IMD and by serogroup. Poisson modeling was used to calculate an incidence rate ratio per year for serogroup B, C and non-C disease. Independent variables were seasonality, age and sex.

RESULTS:

We included 1,003 cases, 64.2% were serogroup B, 18.5% serogroup C, 6% other serogroups and 11.3% unknown serogroup. The overall incidence of IMD declined from 1.80/100,000 (2002) to 0.76/100,000 (2010). The incidence of serogroup C IMD declined from 0.75/100,000 (2002) to 0.06/100,000 (2010) with an estimated incidence rate ratio (IRR) of 0.62 per year ($P<0.001$). The incidence of serogroup B IMD declined from 0.60/100,000 (2002) to 0.46/100,000 (2010) with an estimated IRR of 0.96 per year ($P<0.01$) and of non-C IMD from 0.68/100,000 (2002) to 0.51/100,000 (2010) with an estimated IRR of 0.91 per year ($p<0.0001$).

CONCLUSIONS:

The introduction of meningococcal conjugate vaccines on the Portuguese market has resulted in a strong reduction in the incidence of serogroup C IMD. The decline in serogroup B and non-C IMD may indicate vaccination has not resulted in serogroup replacement and may be explained by the circulation of less invasive clonal complexes.

PRESENTED BY: MR ERIK DE JONGE

Keywords: Meningococcal Infections; Meningitis, Meningococcal; Meningococcal Vaccines; Poisson Distribution

ESCAIDE reference number: 20110239

VACCINE EFFECTIVENESS

Trends in invasive pneumococcal disease in north-east England between 2006 and 2010 following the introduction of the pneumococcal conjugate vaccine

Kaye Chapman, D. Wilson, R. Gorton

AFFILIATIONS:

North East Health Protection Unit, Health Protection Agency, UK

BACKGROUND:

In 2006 a seven-valent pneumococcal conjugate vaccine (PCV7) was introduced into the UK routine childhood immunisation programme. Over 90 pneumococcal serotypes are known that vary in prevalence and virulence. We aimed to investigate the epidemiology of Invasive Pneumococcal Disease (IPD) post-PCV7 in north-east England to explore changes in incidence rates, serotype distribution and outcome of IPD.

METHODS:

An enhanced IPD surveillance system in north-east England collected demographic, clinical, outcome, risk factor and immunisation data on IPD cases with an onset date between April 2006 and March 2010. A case was defined as an individual with clinical symptoms of IPD and isolation of *Streptococcus pneumoniae* from a normally sterile site. Microbiology laboratories reported cases to the Health Protection Unit and further information was obtained from general practitioners and hospitals. Serotypes were provided by HPA Respiratory and Systemic Infections Laboratory. We performed descriptive analysis and compared proportions using Chi-square and Fisher's exact tests.

RESULTS:

The incidence of IPD reduced from 11.9 cases/100,000 in 2006–07 to 9.7 in 2009–10 ($p=0.01352$). We observed a 66% decrease in PCV7 serotype IPD ($p<0.0001$) and a 13% increase in non-PCV7 serotype IPD ($p=0.2757$). The number of deaths fell from 68 in 2006–07 to 43 in 2009–10, with no significant change in case fatality rate (CFR) [22.6% vs 18.0%, $p=0.1997$]. The highest CFRs were in cases with septicaemia (27.0%) and adults ≥ 85 years (45.5%).

CONCLUSIONS:

Since the implementation of PCV7 we have observed a small reduction in the rate of IPD in north-east England, evidence of serotype replacement and a sustained high CFR. Despite the decrease in cases, IPD remains an important public health problem causing significant morbidity and mortality.

PRESENTED BY: DR KAYE CHAPMAN

Keywords: Invasive pneumococcal disease, conjugate vaccines, enhanced surveillance

ESCAIDE reference number: 20110254

ZOOSES

Effectiveness of a screening program for Q fever during pregnancy: a clustered randomised controlled trial

Janna M. Munster (1, 2, 3), A. C. A. P. Leenders (4), C. J. C. M. Hamilton (5), J. C. E. Meekelenkamp (4), P. M. Schneeberger (4), W. van der Hoek (6), A. Rietveld (7), E. de Vries (8), R. P. Stolk (2), J. G. Aarnoudse (3), E. Hak (1, 2)

AFFILIATIONS:

1. University of Groningen, University Centre for Pharmacy, PharmacoEpidemiology & PharmacoEconomics, Groningen, The Netherlands
2. University Medical Centre Groningen, University of Groningen, Department of Epidemiology, Groningen, The Netherlands
3. University Medical Centre Groningen, University of Groningen, Department of Obstetrics and Gynaecology, Groningen, The Netherlands
4. Jeroen Bosch Hospital, Department of Medical Microbiology and Infection Prevention, 's-Hertogenbosch, The Netherlands
5. Jeroen Bosch Hospital, Department of Obstetrics and Gynaecology, 's-Hertogenbosch, The Netherlands
6. National Institute for Public Health and Environment, Bilthoven, The Netherlands
7. Public Health Department "Hart voor Brabant", 's-Hertogenbosch, The Netherlands
8. Jeroen Bosch Hospital, Department of Paediatrics, 's-Hertogenbosch, The Netherlands

BACKGROUND:

In The Netherlands the largest outbreak of Q fever, a zoonosis caused by *Coxiella burnetii*, is ongoing. A particular risk group concerns pregnant women in which the infection may cause obstetric complications and chronic maternal infections. Infections during pregnancy are mostly asymptomatic. Therefore, we aimed to assess the effectiveness of routine serological screening during pregnancy on reducing obstetric and maternal complications.

METHODS:

Midwife centres in Q fever high-risk areas were randomised to recruit women for the screening or for the control strategy. A blood sample was taken between 20 and 32 weeks of gestation. In the screening group this sample was analysed immediately using indirect immunofluorescence assay (cut-off titre 1:32). In case of an acute or chronic infection antibiotic treatment was advised. In the control group samples were frozen and analysed after delivery. The primary endpoint was a composite measure of obstetric complications (preterm delivery, dysmaturity or perinatal mortality) or maternal chronic infection in seropositive women. Odds ratio's (OR) with corresponding 95% confidence intervals (CI) were estimated using generalized linear mixed models to allow for a clustering effect.

RESULTS:

55 midwife centres were randomised. Serology was performed in 1229 participants (536 in the screening group and 693 in the control group). In both groups, 15% had serological evidence for an acute or previous infection. There were no cases of chronic Q fever. There was no difference in the primary endpoint between the two groups (2.2% in the screen and 1.4% in the control group, OR 1.54, 95% CI 0.60 to 3.96).

CONCLUSIONS:

This study does not support routine screening for Q fever of asymptomatic pregnant women living in Q fever high-risk areas.

PRESENTED BY: MISS JANNA MUNSTER

Keywords: Q fever, *Coxiella burnetii*, pregnancy, screening

ESCAIDE reference number: 20110029

PARALLEL SESSION ABSTRACTS

ZOONOSES

Two consecutive *Salmonella* Enteritidis PT4 outbreaks in 2010 related to one laying hen holding: pitfalls of regulatory responses in risk management, Austria

Yu-Lun Liu (1, 2), S. Kasper (1), A. Voss (1), D. Schmid (1), F. Allerberger (1)

AFFILIATIONS:

1. Austrian Agency for Health and Food Safety, Vienna, Austria
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

BACKGROUND:

Following an outbreak of four cases of *S. Enteritidis* phage type 4 (PT4) with onset in May and July 2010, another outbreak of 34 cases of *S. Enteritidis* PT4 occurred among participants of a soccer camp between August 21–27 in East-Austria, linked to the same hotel kitchen and laying hen holding. Food offered by the hotel kitchen was hypothesized as outbreak source. The traced back laying hen holding consisted of two flocks, A and B. As a marketing ban was imposed for flock A in mid-July after having tested positive for the strain of the previous *S. Enteritidis* PT4-outbreak, flock B was suspected as the outbreak strain reservoir. Aim of the investigation was to test these hypotheses.

METHODS:

A retrospective cohort study was performed with 126 out of 143 soccer camp participants. Flock B was tested for *Salmonella*. *Salmonella* isolates were serotyped, phage-typed and genotyped by variable number of tandem repeats (VNTR)-analysis.

RESULTS:

Home-made noodles and hamburger including eggs were the most likely sources of the outbreak (RR=2.68, 95% CI: 1.20-5.99 and RR=2.70, 95% CI: 1.13-6.45). Flock B tested negative for *Salmonella*. The human isolates recovered from the cases of the soccer camp outbreak were indistinguishable by VNTR-pattern from the four human isolates of the previous flock A-related PT4 outbreak and from the isolates found in flock A mid-July (VNTR-pattern 8-6-5).

CONCLUSIONS:

Even though eggs from flock A were condemned for industrial use five weeks before the soccer camp started, the eggs might have been falsely declared as table eggs and sold among eggs from the non-banned flock. Investigations of foodborne outbreaks provide the opportunity to identify pitfalls of regulatory responses in risk management.

PRESENTED BY: DR YU-LUN LIU

Keywords: *Salmonella*, disease outbreaks, foodborne diseases, zoonoses

ESCAIDE reference number: 20110129

ZOONOSES

Large outbreak of Vero cytotoxin-producing *Escherichia coli* O157 infection in visitors to an open farm in South East England in 2009

Peter Kinross (1), C. Ihekweazu (1), K. Carroll (1), B. Adak (2), G. Smith (2), G. C. Pritchard (3), I. A. Gillespie (2), N. Q. Verlander (2), L. Harvey-Vince (1), M. Reacher (1), O. Edeghere (1), B. Sultan (1), R. Cooper (1), G. Morgan (1), N. S. Boxall (2), A. Iversen (1)

AFFILIATIONS:

1. Health Protection Agency, Health Protection Service, UK
2. Health Protection Agency, Centre for Infections, London, UK
3. Veterinary Laboratories Agency, UK

BACKGROUND:

In the summer of 2009, a large outbreak of verocytotoxigenic *Escherichia coli* O157 (VTEC O157) was identified in visitors to an open farm in England which had up to 2,000 visitors a day.

METHODS:

Active case finding was done through local clinicians and microbiologists. Telephone interviews collected standardised data to describe the outbreak's size and severity. Microbiological investigations on human, animal and environmental samples included VNTR and phage type strain typing. A case-control study was conducted to determine the infection source and identify risk factors for transmission using multivariable logistic regression.

RESULTS:

We identified 93 cases; 65 primary, 13 secondary and 15 asymptomatic; 82% were under ten years old. Haemolytic Uraemic Syndrome was diagnosed in 17 cases, none died. Analysis of 23 cases and 117 controls indicated that cases were more likely to have visited a specific animal barn (OR 3.46x10⁸ (2.24x10⁷–5.32x10⁹)), be infrequent visitors (OR 39.26 (4.97–310.03)), and have visited for over 5hrs (OR 5.93 (1.36–25.87)). The causative organism was identified as VTEC O157 PT21/28. This subtype was also found in the physical environment and 80% of farm animal faecal specimens in that same barn.

CONCLUSIONS:

This was the largest outbreak of VTEC O157 associated with animal contact ever reported in England. It was associated with direct and indirect contact with a barn containing several excreting animals. The farm voluntarily closed an animal barn on 4 September and the entire farm on 12 September. No cases visited the farm after 4 September. Animal contact should be urgently reviewed when a farm-related VTEC O157 outbreak is suspected. Health & Safety Executive guidance for UK farms was revised following this outbreak.

PRESENTED BY: MR PETER KINROSS

Keywords: Shiga-Toxigenic *Escherichia coli*, Hemolytic-Uremic Syndrome, zoonoses, disease outbreak

ESCAIDE reference number: 20110155

ZOONOSES

Analysis of factors associated with Salmonella contamination of broiler carcasses, EU-wide baseline survey, 2008

Frank Boelaert, M. T. da Silva Felício, P. Mäkelä

AFFILIATIONS:

European Food Safety Authority, Parma, Italy

BACKGROUND:

Broiler meat is considered to be an important food-borne source of human salmonellosis. An European Union-wide baseline survey was carried out in 2008 at slaughterhouse level to determine the prevalence of Salmonella-contaminated broiler carcasses and to assess quantitatively factors associated with Salmonella contamination of broiler carcasses. The results from the latter risk factor analysis are presented here.

METHODS:

Sampling took place between January and December 2008. A total of 10,035 broiler batches sampled from 561 slaughterhouses in 26 European Union Member States, plus Norway and Switzerland, were included in the survey. From each randomly selected batch one carcass was collected after chilling and the neck skin together with the breast skin was examined for the presence of Salmonella according to ISO 6579:2002 (E).

RESULTS:

EU-level multivariable regression analysis showed that the risk for Salmonella-contaminated carcasses increased with the slaughter capacity of the slaughterhouse and with processing of the carcass later during the day. The risk for contamination of carcasses with Salmonella varied significantly between countries and between slaughterhouses within a country, even when other associated factors were accounted for. The Salmonella serovar distribution varied among Member States. The most commonly reported serovars were S. Infantis, S. Enteritidis and S. Typhimurium. Many of the reported serovars seem to have become well-established in broiler production.

CONCLUSIONS:

Member States may consider the factors found to be associated with Salmonella-contaminated broiler carcasses at European Union level in this survey, when they are designing and implementing national Salmonella control programmes for broiler meat.

PRESENTED BY: MR FRANK BOELAERT

Keywords: Salmonella, broiler carcasses, chicken, baseline survey, risk factors, EU

ESCAIDE reference number: 20110219

SURVEILLANCE

HCV serosurvey in surgery and orthopedic wards to assess general population prevalence

Magdalena Rosińska, P Godzik, M Stępień, A Kotakowska, K Madaliński, A Zieliński

AFFILIATIONS:

National Institute of Public Health – National Institute of Hygiene, Warsaw, Poland

BACKGROUND:

Screening for HCV infection in Poland in general adult population or subgroups is considered. However, reliable HCV prevalence estimates are not available. Our aim was to assess the utility of recruitment of patients with sudden onset conditions from trauma or general surgery wards to estimate HCV prevalence and inform screening policy.

METHODS:

We used preliminary data from ongoing serosurvey started in January 2010, from 18 adult surgical-trauma and orthopedic wards randomly selected from hospital registry in 5 regions in Poland. In each hospital during assigned days all hospitalized patients initially admitted with trauma or pre-specified surgical conditions were asked to participate. Serum samples were tested for anti-HCV in centralized laboratory and ELISA-positive samples confirmed by RIBA. Direct standardization by age group, sex and urban/rural residence accounting for cluster design was performed to obtain national prevalence estimate. Logistic regression for surveys in STATA10 was used for multivariable comparisons. Supported by Ministry of Science and Higher Education, grant NN404191636.

RESULTS:

Overall 3305 cases with definite test results were analyzed, 1322 (40.0%) women and 1980 men (60.0%), median age 47 IQR [32,58]. Overall prevalence in the study population was 1.06% [95% CI 0.69%–1.43%], and standardized estimate – 0.89% [0.55%–1.22%]. Age (adjusted OR vs 70 0.93), male gender (1.03), urban vs rural residence (1.43) were not significantly associated with HCV prevalence.

CONCLUSIONS:

In the considered settings we were able to recruit sufficient representation of general population to produce a robust prevalence estimate. Surprisingly, as opposed to characteristics of newly diagnosed HCV cases reported through surveillance, differences in prevalence by age and gender were small and insignificant suggesting that undiagnosed fraction may be larger among young females.

PRESENTED BY: DR MAGDALENA ROSIŃSKA

Keywords: HCV prevalence, screening, Poland

ESCAIDE reference number: 20110123

PARALLEL SESSION ABSTRACTS

SURVEILLANCE

Prediction of the number of people in Scotland in 2009 infected with chronic Hepatitis B using laboratory-based surveillance

Christian Schnier (1, 2), S. Hutchinson (1,2), K. Tempelton (3), S. Cameron (4), P. Molyneaux (5), P. McIntyre (6), D. Goldberg (1)

AFFILIATIONS:

1. Health Protection Scotland, Meridian Court, 5 Cadogan Street, Glasgow G2 6QE, UK
2. Department of Mathematics and Statistics, Strathclyde University, Glasgow G1 1XO, UK
3. Specialist Virology Centre, Royal Infirmary of Edinburgh, Edinburgh EH16 4SA, UK
4. West of Scotland Specialist Virology Centre, Gartnavel General Hospital, Glasgow G12 0YN, UK
5. Department of Medical Microbiology, Aberdeen Royal Infirmary, Aberdeen AB25 2ZN, UK
6. Department of Medical Microbiology, Ninewells Hospital & Medical School, Dundee DD1 9SY, UK

BACKGROUND:

The prevalence of hepatitis B virus (HBV) infection in England has been estimated at 0.3%. This estimate has been generated on the basis of antenatal screening testing in the West Midlands between 1983 and 1985 and an assumption that compared to women men are twice as likely to become carriers. However, prevalence is heterogeneously distributed with higher prevalence in men, in older people and in certain ethnic minority groups.

METHODS:

To estimate the number of adults with HBV in Scotland we first estimated the prevalence in the adult population stratified by sex, age and ethnicity using information from four specialist virology laboratories. We then predicted the number of people living in Scotland in 2009 belonging to each stratum using migration-adjusted 2001 census data.

RESULTS:

The predicted number of adults living in Scotland with HBV in 2009 was approximately 9,000 (0.21%). Out of the 9000, 3763 (40%) were predicted to have East Asian ethnicity, 5300 (59%) to be male and 4600 (51%) to be aged between 15 and 29. The highest predicted stratum specific prevalences were in 15 to 29 year old East Asians (13%) while the prevalence in the largest stratum (older than 44 year old British) was 0.04% for women and 0.07% for men.

CONCLUSIONS:

The prediction of 9000 cases is 3500 cases fewer than expected using previous prevalence estimates which is most likely due to different demographic pattern in the studied populations. Thus, we illustrate the importance of taking account of variation in HBV prevalence by gender, age and ethnicity. These data will help inform initiatives to test, diagnose and treat those infected with HBV in Scotland.

PRESENTED BY: DR CHRISTIAN SCHNIER

Keywords: Hepatitis B, Chronic, Surveillance, Scotland

ESCAIDE reference number: 20110140

SURVEILLANCE

Sentinel surveillance network for rotavirus diarrhea in six NIS(Newly Independent States) in 2010

Annemarie Wasley (1), L. Mosina (1), D. Videbaek (1), E. Samoilovich (2)

AFFILIATIONS:

1. WHO Regional Office for Europe, Copenhagen, Denmark
2. Belarus Republican Research and Practical Center for Epidemiology and Microbiology, Minsk, Belarus

BACKGROUND:

Rotavirus vaccines effectively protect against severe diarrhea due to rotavirus. Disease burden information, which is needed to make informed decisions about vaccine introduction, is lacking in the eastern part of the WHO European Region. As part of a WHO global initiative, a sentinel surveillance network for rotavirus was established in six NIS countries (Armenia, Azerbaijan, Georgia, the Republic of Moldova, Tajikistan, and Ukraine) with technical support from the WHO Regional Office for Europe.

METHODS:

In selected sentinel hospitals, all children aged <5 years hospitalized with fever and diarrhea were eligible for enrollment. Information on demographics, symptoms and history of illness was obtained using a case report form and fecal samples were collected and tested by enzyme immunoassay(EIA) for rotavirus antigen. Rotavirus positive specimens were genotyped at the WHO regional reference laboratory in Minsk, Belarus.

RESULTS:

In 2010, 6136 of 9080 eligible children across six countries were enrolled and tested. Of these, 2321(38%) were rotavirus positive. This proportion on a country-level ranged from 27%(Azerbaijan) to 48%(Ukraine). The proportion of children who were rotavirus positive increased from 24% among infants aged 0–5 months to 45% among children aged 12–59 months. The proportion of diarrhea due to rotavirus varied seasonally peaking during February to April. Among 443 specimens that were genotyped, the distribution of types was P[8]G1 34%, P[4]G2 13%, P[8]G3 12% , P[8]G4 23% ,P[8]G9 4% with uncommon/untypeable strains accounting for the remaining 15%.

CONCLUSIONS:

Rotavirus accounts for a substantial proportion of diarrhea hospitalizations in six countries within the WHO network. At least 85% of circulating strains included one of the components in available vaccines. This information is now being used to assist national decision-making about implementing rotavirus vaccine.

PRESENTED BY: DR ANNEMARIE WASLEY

Keywords: Rotavirus, surveillance, vaccine preventable disease

ESCAIDE reference number: 20110235

SURVEILLANCE

Bioalarm, syndromic surveillance; Ambulance dispatches

Niels Ladegaard

AFFILIATIONS:

Centre for Biosecurity and Bio Preparedness, Statens Serum Institute, Denmark

BACKGROUND:

Early warning (EW) indicators are essential for Public Security Authorities to provide timely and thorough responses to large scale bioterror incidents, as well as for Public Health Authorities regarding conventional outbreaks. The era of information technology has eased the accessibility of public health care data and opened up the possibility for real time disease surveillance, data analysis and presentation. Bioalarm is one of the first fully automated expert systems developed with the capability of obtaining and analysing health data from various data sources whilst presenting the outputs in web based applications for early warning purpose.

METHODS:

Bioalarm relies on input of daily ambulance dispatch data and uses multiple algorithms for detection of unusual patterns in the distribution of emergency medical dispatches. Bioalarm covers 100% of the Danish population and monitors data at both regional and national level. Bioalarm updates its geographical maps of dispatch patterns every 6 hour.

RESULTS:

Bioalarm has been validated against data from different epidemic outbreaks and is able to detect elevated levels of ambulance dispatches as well as epidemic outbreaks.

CONCLUSIONS:

Bioalarm has been in operation since 2006 and is a fully integrated system with a built-in alert and alarm component, detecting progressive outbreaks as a part of the national disease surveillance programme.

PRESENTED BY: MR NIELS LADEGAARD

Keywords: Ambulance dispatches, Syndromic surveillance, early warning, outbreak detection

ESCAIDE reference number: 20110343

SURVEILLANCE

Postpandemic Sentinel Surveillance for Severe Acute Respiratory Infections, Romania, 2010–2011

Odette Nicolae, A. Pistol, F. Popovici (1)

AFFILIATIONS:

National Institute for Public Health, Bucuresti, Romania

BACKGROUND:

Before 2009 no surveillance system for influenza severity was in place. A hospital based sentinel surveillance system for SARI was implemented during pandemic. The objectives were to estimate SARI incidence, describe etiology and evaluate underlying risk conditions in order to recommend evidence based public health measures. SARI surveillance continued in the first post-pandemic season.

METHODS:

The WHO EURO case definition for SARI was used. Case based notification was established during week 46/2010–20/2011. The denominator was calculated based on the number of admissions in the previous three years in each sentinel hospital. Descriptive analyses was performed using EpiInfo. The underlying risk conditions were evaluated using logistic regression.

RESULTS:

We validated 438 SARI cases. SARI incidence was 7/1000. The positivity rate for SARI cases overall was 48.4% and 36.0% for influenza. Among positive cases, 37.7% were confirmed with influenza virus A(H1N1)2009 and 36.3% with influenza virus type B. Other etiologies were also observed, mainly RSV. No underlying risk conditions were reported for 48.4% SARI cases. Among SARI cases confirmed with A(H1N1)2009, obesity was the single significant risk factor. Additionally, chronic liver and kidney diseases were detected as risk factors in women, and compromised immunity in men. The case fatality ratio for SARI cases overall was 6.8% and 13.3% for those confirmed with influenza.

CONCLUSIONS:

Severity of confirmed SARI cases was almost double compared to SARI cases overall. Corroborating the SARI incidence and the positivity rate for influenza in SARI cases we can estimate the number of confirmed SARI cases preventable by vaccination in the catchment area. The underlying risk conditions are evidence based arguments to issue recommendations for influenza prevention in certain risk groups.

PRESENTED BY: DR ODETTE NICOLAE

Keywords: Influenza, severity, underlying risk conditions, prevention

ESCAIDE reference number: 20110246

PARALLEL SESSION ABSTRACTS

VACCINE SAFETY AND ASSESSMENT

Vaccine safety of a new conjugate vaccine against group A meningococcus during the September 2010 mass vaccination campaign in Filingue, Niger

Maman Sani Chaibou (1), M. Sambo (2), H. Messan (2), S. Djibo (2), A. Lado (2), H. Bako (1), L. Salisou (1), T. Yameogo (3), S. Kim (4), S. Diallo (5), T. Coulibaly (5), M. H. Djingarey (3), W. A. Perea (6), P. L. F. Zuber (6), L. Pezzoli (4)(6)

AFFILIATIONS:

1. National Hospital, Niamey, Niger
2. Ministry of Public Health, Niamey, Niger
3. Inter-country Support Team for West Africa, World Health Organization, Ouagadougou, Burkina Faso
4. Translational Research Division, International Vaccine Institute, Seoul, Republic of Korea
5. Niger Country Office, World Health Organization, Niamey, Niger
6. Headquarters, World Health Organization, Geneva, Switzerland

BACKGROUND:

The MenAfriVac is a new conjugate vaccine against *Neisseria meningitidis* serogroup A, the major cause of epidemic meningitis in sub-Saharan Africa. In Niger, the MenAfriVac introduction campaign was conducted in the District of Filingue, during September 2010, targeting 392,211 individuals aged 1–29 years. We set up an active and passive surveillance to monitor adverse events following immunization (AEFI) during the campaign period and 42 days thereafter.

METHODS:

We designated 33 health centres as surveillance units, which reported AEFIs on a daily basis to the health district headquarters. Using active surveillance, patients presenting at units were screened for possible AEFIs and vaccination status. Using passive surveillance, patients presenting at units or at vaccination posts with complaints after vaccination were also found. Cases were defined as serious (results in death or hospitalization) or minor. A National Expert Committee was established to determine if serious cases were causally associated with the vaccine.

RESULTS:

In total, 355,653 doses of vaccine were administered; during 61 days of monitoring, 82 suspected AEFIs were reported: 16 severe and 66 minor. The incidence was of 23.1 per 100,000 doses. Among the severe cases, 14 were classified as coincidences, one urticaria complicated by respiratory distress was classified as probable, and one death was unclassifiable because post-mortem information was unavailable. The number of units that notified at least one case was 22/33 (71.0%).

CONCLUSIONS:

The surveillance provided reassuring data on the safety of the MenAfriVac, although possible underreporting of cases may have been a limitation. It was feasible to conduct active and passive surveillance during and after the mass campaign. Once the vaccine will be introduced on a larger scale, we recommend retaining only the passive component.

PRESENTED BY: DR MAMAN SANI CHAIBOU

Keywords: Conjugate meningitis vaccine; MenAfriVac; *Neisseria meningitidis* A; adverse events following immunization; Niger

ESCAIDE reference number: 20110033

VACCINE SAFETY AND ASSESSMENT

Trends in Meningococcal Disease in Spain following the introduction of the Meningococcal C conjugated Vaccine

Zaida Herrador (1)(2), R. Cano (2), V. Flores (2), F. Simon (2).

AFFILIATIONS:

1. Field Epidemiology Training Program (PEAC), Madrid, Spain.
2. Centro Nacional de Epidemiología, Instituto de Salud Carlos III, Madrid, Spain.

BACKGROUND:

In December 2000 the meningococcal C conjugate vaccination was included in Spanish immunization schedules. Current vaccine coverage is close to 97%. The objective of this study is to describe the trends of meningococcal disease (MD) serogroups C and non-C in Spain after the introduction of the vaccine.

METHODS:

Time series analysis (TSA) of weekly confirmed meningococcal disease cases (MDC) and MDc by serogroup (C, B and others) notified to the National Surveillance Network (RNVE) from 2000 to 2009 were modelled using three different methods: cyclical regression, historical moving averages and ARIMA. Data variability was previously controlled by applying the transformation coefficient that better normalised data according to the Box-Cox algorithm as proposed in the TSA library for R statistical package. Prediction models for the year 2010 were estimated and compared with observed MDc in that year. Alert threshold were established as the upper limit of the 95% confidence interval for the expected value. Models were built for serogroups C, B and total MDC.

RESULTS:

We found annual seasonality with winter-spring peaks and a global decreasing trend, steeper for serogroup C. All methods produced comparable results in terms of prediction and warning threshold limits, both globally and by serogroup. Models allowed us to identify 2–3 outbreaks of serogroup C and none of serogroup B, similar to the number of MDc outbreaks later reported to the RNVE in 2010.

CONCLUSIONS:

Our results show a decrease of meningitis C after introducing the vaccine. Results do not show any evidence of capsule switching following vaccination. According to our results, TSA can be useful not only for health impact assessment but also for timely outbreak detection.

PRESENTED BY: DR ZAIDA HERRADOR

Keywords: Meningococcal Meningitis, Meningococcal vaccine, Trends, Statistical models

ESCAIDE reference number: 20110063

VACCINE SAFETY AND ASSESSMENT

Abrupt increase in incidence of narcolepsy in children and adolescents, not in adults after pandemic vaccination in Finland in 2010

Hanna Nohynek (1), J. Jokinen (1), M. Partinen (2), O. Vaarala O (1), T. Kirjavainen T (3), J. Sundman (1), S.-L. Himanen (4), C. Hublin (5), I. Julkunen I (1), P. Olsén (6), O. Saarenpää-Heikkilä (4) T. Kilpi (1)

AFFILIATIONS:

1. National Institute for Health and Welfare, Helsinki, Finland
2. Helsinki Sleep Center, Vitalmed Oy, Helsinki, Finland
3. Helsinki University Central Hospital, Helsinki, Finland
4. Pirkanmaa Hospital Center, Tampere, Finland
5. Institute for Occupational Health, Helsinki, Finland
6. Oulu University Hospital, Oulu, Finland

BACKGROUND:

Narcolepsy is autoimmune disease with genetic predisposition causing excessive daytime sleepiness (EDS) and cataplexy. Sudden increase in childhood narcolepsy was observed in Finland soon after influenza pandemic and nationwide vaccination with AS03-adjuvanted Pandemrix. We conducted retrospective cohort study to evaluate association between pandemic vaccination and narcolepsy.

METHODS:

From January 1, 2009 to August 16, 2010, we retrospectively followed entire population of Finland. Vaccination data was obtained from primary health databases. All new cases ICD-10-coded G47.4 narcolepsy were identified from hospital discharge registers. Medical records were independently reviewed by two experts according to Brighton collaboration criteria. Narcolepsy onset was defined as first documented contact to health care because of EDS for <20 year-olds and as onset date in medical records for adults.

RESULTS:

Vaccination coverage was mean 51.6 % (range 31.7% in 25–29 year-olds to 81.9% in 10–14 year-olds). Of 67 confirmed child-cases of narcolepsy, 46 vaccinated and 7 unvaccinated were included in primary analysis. Among 4–19-year-olds, incidence of narcolepsy was 9.0 in vaccinated as compared to 0.7 /100,000 person years in unvaccinated individuals, rate ratio 12.7 (95%CI 6.1–30.8). Vaccine-attributable risk of developing narcolepsy was 1:16 000 vaccinated 4–19-year-olds. No such risk was seen in adults <50 years old (1 case vaccinated, 6 nonvaccinated, RR 0.9, 95%CI 0-5.4).

CONCLUSIONS:

Pandemrix vaccine contributed to onset of narcolepsy among 4–19 year-olds during pandemic influenza in 2009–2010 in Finland. No such increase was seen among adults. Further studies are needed to determine whether this observation exists in other populations and to elucidate underlying immunological mechanism. Caution needs to be exercised when drawing conclusion about use of adjuvanted pandemic vaccines in different populations and development of adjuvants.

PRESENTED BY: DR HANNA NOHYNEK

Keywords: Narcolepsy, vaccination, adverse event

ESCAIDE reference number: 20110256

VACCINE SAFETY AND ASSESSMENT

Molecular epidemiology of rotavirus strains in European Countries with or without rotavirus immunization programs

Miren Iturriza-Gómara, Sameena Nawaz for EuroRotaNet network and Kari Johansen

AFFILIATIONS:

Enteric Virus Unit, Virus Reference Department, HPA, London, United Kingdom 2 Surveillance and Response Support Unit, European Centre for Disease Prevention and Control, Stockholm, Sweden

BACKGROUND:

Rotaviruses (RV) are the most common cause of infantile gastroenteritis worldwide. In Europe, RV infections account for ~700,000 outpatient visits and >87,000 hospitalizations yearly. In 2006, two RV vaccines were licensed for infants less than six months. In 2009 the WHO recommended RV vaccine for all children. To date only a limited number of European countries have implemented RV immunization programs.

METHODS:

RV strain surveillance is being conducted in 17 European countries, including 2 with universal RV vaccination. RV strains were G and P typed and emerging genotypes were further characterized through partial sequencing. The diversity of RV strains circulating in countries with or without RV immunization programs was analysed.

RESULTS:

A total of 44 different RV genotypes were identified in from 27,789 RV-positive samples collected between 2006 and 2010. Common human RVs made up 96% of the strains. Emerging RVs in Europe included G6, G8, G10 and G12 strains. In countries with universal RV vaccination a significant decrease in the numbers of RV-positive cases was seen. No unusual strains were detected since vaccine introduction in 2009 in Finland. An unusual sustained high prevalence of G2P[4] strains was observed in Belgium since the introduction of RV immunization. However, the age distribution suggests that this is unlikely to be associated with vaccine failure. Whole genome characterisation of strains from Belgium has not detected vaccine derived strains associated with cases of gastroenteritis.

CONCLUSIONS:

Emergence of unusual genotypes was seen in the absence of RV immunization. Demographic and molecular data suggest different emergence patterns for G6, G8, G10 and G12 RVs from localized emergence with poor human host adaptation to multiple widespread introductions and human adaptation resulting in person-to-person transmission.

PRESENTED BY: DR MIREN ITURRIZA-GOMARA

Keywords: Rotavirus, G type, P type, emerging strains

ESCAIDE reference number: 20110266

PARALLEL SESSION ABSTRACTS

VACCINE SAFETY AND ASSESSMENT

Assessing the impact of hepatitis B risk group vaccination: The power of combining different surveillance methods

Susan Hahné (1), R. van Houdt (2), F. D. H. Koedijk (1), M. van Ballegooijen (1), S. M. Bruisten (2), M. van Dam (1), J. Cremer (1), H. E. de Melker (1), H. J. Boot (1)

AFFILIATIONS:

1. Centre for Infectious Disease Control, National Institute for Public Health and the Environment, RIVM, Bilthoven, the Netherlands
2. Public Health Service, Department of Infectious Diseases, Amsterdam, the Netherlands

BACKGROUND:

In the Netherlands, transmission of hepatitis B virus (HBV) is mainly restricted to men who have sex with men (MSM). They are offered HBV vaccination since 2002. We aimed to assess the effectiveness of this programme in order to guide its implementation.

METHODS:

We analysed data of the HBV risk-group vaccination programme [2002–2010] and of acute HBV notifications [2004–2010]. We aimed to collect sera of all acute HBV notifications between 2004–2010. Of these, HBV-DNA was isolated and the S-gene (644 nt) sequenced. We analysed sequences by constructing phylogenetic trees (neighbour joining, Kimura-2, 1000 bootstraps) and minimum spanning trees, by year, including epidemiological information on route of acquisition. We applied coalescent analyses to study genetic diversity.

RESULTS:

Between 2002 and 2010, 32493 MSM received their first HBV vaccination. The number of acute HBV notifications declined from 296 in 2004 to 182 in 2010, mostly caused by a decline in the number of cases among MSM (from 105 to 47). Cases in MSM were predominantly caused by an identical genotype A2 strain. Diversity of this strain decreased over time. Strains from cases in other risk groups showed little clustering.

CONCLUSIONS:

The decline in the number of acute HBV cases in MSM, in the proportion of genotype A2 strains among acute HBV patients, and in the genetic variability within the genotype A2 strain circulating among MSM indicate that the targeted vaccination programme is effective. Since there is ongoing transmission of HBV among MSM, the targeted vaccination programme should continue. Since strains from heterosexually acquired cases show little clustering, heterosexuals should not be a target group for selective HBV-vaccination. Combining different surveillance methods is important when assessing effectiveness of intervention programmes.

PRESENTED BY: DR SUSAN HAHNÉ

Keywords: Hepatitis B, vaccination, molecular epidemiology

ESCAIDE reference number: 20110268

VACCINE PREVENTABLE DISEASES

Poliomyelitis outbreak in young adults in Pointe-Noire, Republic of the Congo, 2010

Arnaud Le Menach (1, 2), A. Llosa (3), I. Mouniaman-Nara (4), F. Kouassi (5), J. (6), N. Boxall (1), K. Porten (3), R. F. Grais (3)

AFFILIATIONS:

1. Health Protection Agency, London and South East Regional Epidemiology Units, 151 Buckingham Palace Road, London, SW1W 9SZ, England, UK
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Control and Prevention (ECDC) Stockholm, Sweden
3. Epicentre, Paris, France
4. Medecins Sans Frontiere France, Paris, France
5. Medecins Sans Frontiere France, Brazzaville, Congo
6. Direction Départementale de la Sante de Pointe-Noire, Pointe-Noire, Congo

BACKGROUND:

On 4 November 2010, the Ministry of Health of the Republic of Congo declared a poliomyelitis outbreak in Pointe-Noire. We conducted an outbreak investigation to: describe the epidemic, better understand virus spread, estimate vaccination coverage and make recommendations for control.

METHODS:

We collected clinical, demographic and geographic data about cases and vaccination policies from local health authorities. Cases were residents of Pointe-Noire of any age, diagnosed with acute flaccid paralysis (AFP) between 01 October 2010 and 27 February 2011. We conducted a household-based cross-sectional survey sampling systematically among all residents in a socially heterogeneous affected neighbourhood. We assessed vaccination coverage and risk factors for disease transmission especially regarding sanitary conditions. The calculated sample size was 246 children under 5 for an expected vaccination coverage of 80%, 5% precision, 95% confidence level.

RESULTS:

A total of 451 AFP cases were reported (case fatality ratio: 41.3%), of whom 68% were male, and 57.4% between 15–24 years of age. To achieve the required sample we surveyed 317 households (1,849 individuals). Vaccination coverage for one or more doses of oral polio vaccine was 55.5% (95% Confidence Interval: 53.3–57.8) and decreased with age to 33.5% (95% CI: 29.4–37.3) for individuals older than 30. Sanitary conditions were poor with latrines commonly shared between households (57.4%; 95% CI: 51.8–63.1).

CONCLUSIONS:

Poor vaccination coverage led to a large susceptible population, particularly in young adults. Spread was facilitated by poor sanitary conditions. Polio causes more severe illness in adults partially explaining the high observed case-fatality ratio. Supplementary vaccination activities should not only target children under 5 but also older age groups in any countries with evidence of immunity gaps.

PRESENTED BY: DR ARNAUD LE MENACH

Keywords: Poliomyelitis, Republic of the Congo, Epidemiology, Infectious Disease Outbreaks, Active Immunization, Cross-Sectional Survey

ESCAIDE reference number: 20110138

VACCINE PREVENTABLE DISEASES

High proportion of adults affected by community outbreak of measles in Berlin, Germany, April–June 2011

Sofie Gillesberg Lassen (1, 2), Melanie Schuster (2), Markus Stemmler (3), Anne Steinmüller (4), Dorothea Matysiak-Klose (2), Annette Mankertz (5), Sabine Santibanez (5), Ole Wichmann (2), Gerhard Falkenhorst (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Robert Koch Institute (RKI), Dept. Infectious Disease Epidemiology, Berlin, Germany
3. Gesundheitsamt Berlin-Reinickendorf, Germany
4. Practising paediatrician and school doctor, Berlin, Germany
5. Robert Koch Institute (RKI), Unit Viral Infections, Berlin, Germany

BACKGROUND:

On 09/05/2011, the Robert Koch Institute was asked to support the investigation of a measles outbreak in Reinickendorf, Berlin. We aimed to determine the extent of the outbreak and estimate vaccine effectiveness (VE).

METHODS:

We conducted a descriptive epidemiological study using structured questionnaires. Probable cases were persons with measles-specific symptoms living or working in Reinickendorf, with disease onset after 01/04/2011. Confirmed cases were IgM- or PCR-positive. Detected measles viruses (MV) were genotyped to analyze the transmission chain. Using a cohort of 55 school children with exposure to a measles case during a four-day trip, VE was calculated based on observed attack rates (AR) in vaccinated and unvaccinated children using exact Poisson regression. Confidence intervals (CI) of 95% were calculated.

RESULTS:

Up until 30/06/2011, 35 probable and 38 confirmed cases were identified: 20 school trip cohort cases, 14 secondary cases among their family and friends, and 39 community cases without link to the school. Information on age was available for 37 of the 39 community cases: 27% (10/37) were 10–19 and 35% (13/37) were 20–41. Thirty-one (79%) were unvaccinated, 2 (5%) were vaccinated once, and for 6 (15%) vaccination status was unknown. Preliminary data of the school trip cohort indicate an AR of 92% among unvaccinated children and VE of 97.7% (95%CI: 86.5–100) for at least one measles vaccination. MV variant D4-Ljubljana was identified in all 24 cases with genotype information, including school trip and community cases.

CONCLUSIONS:

Detection of the same genetic variant of MV supports that all cases belonged to the outbreak. VE was high. Our findings reemphasise the German recommendation to target not only children, but also adolescents and adults born after 1970 for measles vaccination.

PRESENTED BY: MS SOFIE GILLESBERG LASSEN

Keywords: Measles, Outbreak, Vaccine Effectiveness, Germany

ESCAIDE reference number: 20110172

VACCINE PREVENTABLE DISEASES

Measles outbreak in France: still far from disease elimination!

Isabelle Parent du Châtelet (1), D. Antona (1), C. Baudon (1), F. Freymuth (2), D. Lévy-Bruhl (1)

AFFILIATIONS:

1. French institute for public health surveillance (InVS), Saint-Maurice, France
2. National Reference Centre for Measles, Caen, France

BACKGROUND:

The measles vaccination introduction in the immunization schedule in 1983 has led to a dramatic decrease of measles incidence in France, estimated below 0.10 per 100,000 inhabitants in 2006 and 2007. But starting in 2008 onward, France is facing a massive resurgence of the disease.

METHODS:

Measles surveillance in France has been based on mandatory reporting since mid-2005. Notifications are analysed at national level by the French Institute for Public Health Surveillance (InVS). Clinical, laboratory-confirmed or epidemiologically linked cases meeting the national case definition were included in the analysis

RESULTS:

As of 1st May 2011, almost 20,000 cases have been notified since January 2008. The highest incidence was observed in children <10 years, reaching 120 cases /100,000 for the last 12 months of surveillance. Median age of cases increased over time from 12 to 16 years of age. The disease burden is very high with 4000 hospitalised cases, among which 804 severe pneumonias and 26 encephalitis/ myelitis were reported. 10 people died among which 7 were immunocompromised. Among cases with a known vaccination status, 83% were unvaccinated, 17% vaccinated (13% with 1 dose, 3% 2 doses, 1%: unknown). The main virus strain circulating in 2011 was D4 (MVs/Montaignu.FRA/43.08(D4)).

CONCLUSIONS:

This situation is the consequence of insufficient vaccine coverage (below 90 % for the first dose at 24 months) leading to the accumulation of susceptible people over time. Moreover, several factors argue for an underestimation of the current incidence of the disease. This situation underlines the need for urgent strengthened communication and vaccination measures targeting susceptible individuals in children, adolescents and young adults in order to reach the immunity levels needed to stop the virus circulation.

PRESENTED BY: DR DENISE ANTONA

Keywords: Measles, outbreak, epidemiology, France

ESCAIDE reference number: 20110220

PARALLEL SESSION ABSTRACTS

VACCINE PREVENTABLE DISEASES

Measles outbreaks in anthroposophic schools in Southwest Germany, February to June 2011 – Challenges in control interventions

Elisabeth Aichinger (1, 2, 3), M. Pods (4), K. Giessler (5), S. Maassen (6), G. Pfaff (1)

AFFILIATIONS:

1. Baden-Wuerttemberg State Health Office, District Government Stuttgart, Germany
2. Postgraduate Training for Applied Epidemiology (PAE), Robert Koch-Institute, Berlin, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control, Stockholm, Sweden
4. Public Health Office, Karlsruhe, Germany
5. Public Health Office, Offenburg, Germany
6. Public Health Office, Freiburg, Germany

BACKGROUND:

In communities with low coverage of measles containing vaccines (MCV), measles cause large, prolonged outbreaks. We assessed the burden of measles in three anthroposophic schools in Baden-Wuerttemberg (BW), Southwest Germany, to inform future outbreak management in this setting.

METHODS:

We described measles outbreaks among students and contact persons in schools A, B, C and control interventions implemented by school boards and local public health authorities. Cases were defined as clinically diagnosed measles within the student population or within contact persons, such as family members or friends.

RESULTS:

Between February-June 2011 222/495 (45%) of measles cases notified in BW could be linked to one of three school outbreaks. The attack rates were 0.7% (6/851), 3.6% (20/550), and 22.1% (132/596) in schools A, B and C. Sixty-four measles cases occurred in contact persons. The outbreaks in schools A, B and C lasted 20, 66 and 117 days. After the first measles case occurred, school boards advised parents to keep children with measles at home. In schools A and B, subsequent cases occurred within days. Vaccination records were reviewed and non-immune children were excluded until the incubation period of the last case had elapsed. School C opted for school-closure of 16 days. However, further cases occurred due to ongoing extracurricular contact between students. Thereafter, school attendance was only permitted for students with medical certificates confirming past measles infection or immunisation with MCV.

CONCLUSIONS:

Measles outbreaks require strict and timely control interventions. School closures appear less effective if extracurricular contacts between students continue and parents avoid MCV immunisations of their children. Control interventions should be communicated with parents in order to interrupt infection chains and prevent prolonged school closures.

PRESENTED BY: DR ELISABETH AICHINGER

Keywords: Measles, outbreak, anthroposophic school, Rudolf Steiner school

ESCAIDE reference number: 20110186

VACCINE PREVENTABLE DISEASES

Pertussis in Europe from 1980–2010 – incidence and vaccination coverage

Elisabeth Eva Kanitz (1,2), Bacci S. (3), C. Giambi (1), S. Glismann (3), E. Appelgren (1), F. D'Ancona (1)

AFFILIATIONS:

1. Istituto Superiore di Sanità, Rome, Italy
2. European Programme of Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control, Stockholm, Sweden
3. EUVAC.NET, Statens Serum Institut, Copenhagen, Denmark

BACKGROUND:

Pertussis vaccination programmes are in place in all European countries, nevertheless pertussis is still occurring. In the framework of the ECDC-funded VENICE II project, and in collaboration with EUVAC.NET, we reviewed available data to estimate the impact of pertussis vaccination on the disease burden in EU- and EFTA-countries, in order to gain an overview of the situation in Europe.

METHODS:

Routine data on DTP3 coverage and cases of pertussis reported to WHO or ECDC based on routine surveillance between 1980–2010, reported cases by age-group to EUVAC.NET between 2003–2008, vaccination recommendations, and published literature were reviewed for 29 EU- and EFTA countries.

RESULTS:

Nationwide comprehensive reporting was absent in Belgium, France and Germany. Among the remaining 26 countries, the average incidence between 2005–2010 was 10.0 per 100,000. Highest yearly incidences since 2005 were reported by Norway (142/100,000 in 2006), Estonia (97/100,000 in 2010), the Netherlands (53/100,000 in 2008), Slovenia (29,8/100,000 in 2010) and Slovakia (25/100,000 in 2010). The Netherlands and Slovakia have continuously reported a DTP3 coverage >95% since 1995, Norway and Slovenia above >90% since 1995 and Estonia >90% since 1999. The most affected age groups were 10–14 year-olds in Estonia, the Netherlands, Norway and Slovenia, and <1 year-old in Slovakia.

CONCLUSIONS:

Despite high DTP3 coverage, some countries observe a high pertussis incidence affecting different age groups. These variations show that incidence, vaccine coverage data and vaccination schedules need to be analysed jointly to identify intervention targets. Differences in surveillance systems and vaccination coverage data collection could affect the comparison among countries. More reliable and detailed coverage data are needed in order to be able to explain observed discrepancies between vaccination programme performance and impact.

PRESENTED BY: MRS ELISABETH EVA KANITZ

Keywords: Pertussis

ESCAIDE reference number: 20110278

BURDEN OF DISEASE

The burden of influenza: evaluation of the Disability Adjusted Life Years (DALYs) and hospital utilization in Italy

Silvia Longhi (1), C. de Waure (1), W. Ricciardi (1), E. Franco (2), C. Rizzo (3), F. Di Nardo (1), C. Gibbons (4), M.J. Mangen (6), J. Brooke (6), A. Cassini (5), P. Kramarz (5), M. Kretzschmar (6)

AFFILIATIONS:

1. Catholic University of the Sacred Heart of Rome, Italy
2. Tor Vergata University, Rome
3. Istituto Superiore di Sanità (ISS)
4. University of Edinburgh
5. European Centre of Disease Prevention and Control
6. RIVM

BACKGROUND:

In 2009 we participated in the project “Burden of Communicable Diseases in the EU and EEA/EFTA countries”. Italy was chosen as one of the test countries to perform the field study in order to apply the methodology developed for estimating the burden of communicable diseases. The aim of this abstract is to present the preliminary results for influenza and its impact in terms of DALYs on the Italian population.

METHODS:

Since influenza notification is not mandatory in Italy and the sentinel surveillance system does not provide disaggregated data, the decision was made to use the hospital discharges database of the Italian Ministry of Health. In developing the outcome tree we considered different complications and their long-term sequelae. We provided best estimates of the transition probabilities, durations and disability weights. Underreporting for hospital discharges was corrected by a multiplication factor.

RESULTS:

In the period 2005–2007 the burden of influenza in DALYs per year is 24,241, while the DALY rate per 100,000 is 39.4. The stratification by age shows a higher DALYs per year in the extreme groups of the age pyramid (0, 1–4 years and 80–84, 85+) for both genders. Women have a greater burden of influenza than men, which is remarkable especially for the age groups older than 60 years.

CONCLUSIONS:

A good estimate of the burden for infectious disease is needed to help set priorities for reducing their impact on the population. The methodology applied and its adjustments for underreporting showed to provide reliable estimates of influenza burden, notwithstanding the limitations from the use of hospitalization discharges. As a result, it can be properly used for those countries where surveillance systems do not provide adequate incidence data.

PRESENTED BY: MRS SILVIA LONGHI

Keywords: Influenza, burden, communicable diseases

ESCAIDE reference number: 20110104

BURDEN OF DISEASE

The pathogen – and incidence based DALY approach – a method to measure the burden of communicable diseases in Europe

Marie-Josée J. Mangen (1); D. Plass (2); A. Cassini (3), A. Van Lier (4); S. Longhi (5); A. H. Havelaar (4, 6); C. Gibbons (7); J. Haagsma (1, 8); J. Brooke (1); N. Mühlberger (9); P. Pinheiro (2); W. Van Pelt (4); P. Kramarz (3), M. E. Kretzschmar (1, 4)

AFFILIATIONS:

1. University Medical Centre Utrecht (UMCU), Utrecht, the Netherlands
2. University of Bielefeld, Bielefeld, Germany
3. European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
4. National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands
5. Catholic University of the Sacred Heart, Rome, Italy
6. University Utrecht, Utrecht, the Netherlands
7. University of Edinburgh, Edinburgh, UK
8. Erasmus University, Rotterdam, the Netherlands
9. UMIT – University for Health Sciences, Medical Informatics and Technology, Hall i.T., Austria
10. Ministry of Social Affairs, Tallinn, Estonia
11. National Institute for Health Development. Tallinn, Estonia

BACKGROUND:

In 2009 the ECDC, responsible for guidance in infectious disease control in Europe, initiated the Burden of Communicable Disease (BCoDE) project, aiming at generating evidence-based, valid and comparable estimates of the burden of communicable diseases and related conditions in Europe.

METHODS:

The metric used is the DALY (Disability-Adjusted Life Year), a health gap measure composed of years of life lost due to premature death (YLL) and due to disability (YLD). To better represent the burden caused by communicable diseases a pathogen based approach was used, which links incidence of infections to their sequelae through outcome trees. Health outcomes are considered if there is a causal relationship between infection and outcome. Life expectancy as recommended by WHO is used for YLL. For YLD, disability weights are based on the GBD study, alternative sets or proxies. No time discounting or age-weighting is applied. Disease progression parameters are based on literature reviews and expert opinion. Country specific incidence of infections is preferably based on notification data corrected for underestimation using multiplication factors. The models, implemented in Excel using @Risk, allow explicit modelling of uncertainty in multiplication factors and conditional transition probabilities via Monte-Carlo simulations.

RESULTS:

Using Salmonella as an illustration, the disease burden in the Netherlands is 2,100 DALYs/1,280 YLD/820 YLL per year, or 12,9 DALYs per 100,000 population per year and 0,03 DALYs per year per infected case. The sequelae Reactive Arthritis and Irritable bowel syndrome, account for 55% of the total burden. The young and the elderly show higher burdens than other age classes. No significant gender difference is observed.

CONCLUSIONS:

The current methodology allows prioritisation and comparison of communicable diseases burden across diseases and with other health hazards.

PRESENTED BY: DR JUANITA HAAGSMA

Keywords: Infectious diseases; value of life; disease burden; disability adjusted life years; underestimation

ESCAIDE reference number: 20110229

PARALLEL SESSION ABSTRACTS

BURDEN OF DISEASE

Measuring the burden of communicable diseases – linking disability weights and incidence data

J. A. Haagsma (1, 2), M. J. J. Mangen (1); D. Plass (3); S. Longhi (4); A. H. Havelaar (5, 6); E. A. Van Lier (5); M. E. E. Kretzschmar (1, 5)

AFFILIATIONS:

1. University Medical Centre Utrecht (UMCU), Utrecht, the Netherlands
2. Erasmus Medical Centre, Erasmus University, Rotterdam, the Netherlands
3. University of Bielefeld, Bielefeld, Germany
4. Catholic University of the Sacred Heart, Rome, Italy
5. National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands
6. University Utrecht, Utrecht, the Netherlands

BACKGROUND:

The Burden of Communicable Disease (BCoDE) project aims to assess the burden of 32 communicable diseases in all European Union Member States, expressed in Disability Adjusted Life Year (DALY), a health gap measure increasingly used for priority setting in health care and prevention. The DALY aggregates mortality and morbidity data and allows comparison of population health status between diseases and/or subgroups of a population. Essential for the calculation of the DALY is the disability weight, which is linked to and subsequently multiplied by incidence data and duration to calculate the morbidity component of the DALY. The aim of the current study was to map disability weights to health outcomes of communicable diseases selected for the BCoDE project.

METHODS:

Outcome trees for 32 communicable diseases were constructed to assess relevant health outcomes. Subsequently, a literature review of existing sets of disability weights was performed. The disability weights were critically appraised according to underlying methodology and mapped to the health outcomes.

RESULTS:

There were several existing sets of disability weights. Nevertheless, for many health outcomes of infectious diseases, disability weights were not available from any of the existing sets. Secondly, if disability weights were available, there was often a misfit between the disability weight and the incidence data that is used for the DALY calculation, e.g. health states in the population were more severe than the health state depicted by the disability weights or vice versa.

CONCLUSIONS:

The misfit between incidence data and available disability weights results in inaccurate burden of disease estimates. This may affect resource allocation and the identification of important prevention priorities in public health. To explore the magnitude of inaccuracies, sensitivity analysis may be carried out.

PRESENTED BY: DR JUANITA HAAGSMA

Keywords: Infectious diseases; value of life; disease burden; disability adjusted life years

ESCAIDE reference number: 20110255

BURDEN OF DISEASE

Ranking the burden of infectious diseases: the Ontario Burden of Infectious Disease Study (ONBOIDS)

Jeffrey C. Kwong (1, 2), M. A. Campitelli (1), S. Ratnasingham (1), N. Daneman (1), S. L. Deeks (2), D. G. Manuel (3), N. S. Crowcroft (2)

AFFILIATIONS:

1. Institute for Clinical Evaluative Sciences, Toronto, Ontario
2. Ontario Agency for Health Protection and Promotion, Toronto, Ontario
3. Ottawa Hospital Research Institute, Ottawa, Ontario

BACKGROUND:

Evidence-based priority setting requires knowledge about the relative contributions of diseases to the loss of healthy life. We sought to determine the relative contribution of a wide range of infectious diseases in order to inform priority setting, planning and decision-making in Ontario, Canada (N=12.2 million in 2006).

METHODS:

Health-adjusted life years (HALYs), a composite health gap measure similar to the Global Burden of Disease's Disability Adjusted Life Years (DALYs), were used to measure premature mortality and reduced functioning due to disease. Deaths were estimated from vital statistics data during 2003–2005. Disease incidence was estimated during 2005–2007 from reportable disease, health care utilization and cancer registry data, supplemented by local modelling studies and national/international epidemiologic studies.

RESULTS:

Each year in Ontario, there are over 7,000,000 infectious disease episodes and nearly 4,900 deaths from infectious diseases. The ten most burdensome infectious agents are: hepatitis C virus, *Streptococcus pneumoniae*, human papillomavirus, hepatitis B virus, *Escherichia coli*, HIV/AIDS, *Staphylococcus aureus*, influenza, *Clostridium difficile* and rhinovirus. More than 80% of the health burden of infectious diseases is from premature mortality rather than from disease-associated morbidity. Our annual estimate of 679 HALYs per 100,000 for the infectious disease studied was close to one-quarter of the HALYs estimated for all cancers in a Canadian study that used similar methodology.

CONCLUSIONS:

This is the most comprehensive examination of the burden of infectious diseases to date. Our findings have implications for priority setting at local and provincial levels. While the prevention of some infectious diseases will require the development of novel interventions, much of Ontario's infectious disease burden could be reduced through better implementation of existing interventions (e.g., immunization), particularly by improving outreach to high risk groups.

PRESENTED BY: MS SUJITHA RATNASINGHAM

Keywords: 'Burden of disease', 'infectious disease'

ESCAIDE reference number: 20110301

FOOD AND WATER BORNE DISEASE: SURVEILLANCE AND METHODS

Usefulness of a web-based questionnaire for quantification and investigation during a large waterborne cryptosporidiosis outbreak in Northern Sweden, April 2011

Valérie Decraene (1, 2), A.-M. Kling (2), J. Jonsson (2), S. Kühlmann-Berenzon (2), M. Löfdahl (3), S. Stenmark (4), J. Wiström (4), A. Wallensten (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Department of Analysis and Prevention, Swedish Institute for Communicable Disease Control, Solna, Sweden
3. Department of Preparedness, Swedish Institute for Communicable Disease Control, Solna, Sweden
4. Department of Communicable Disease Control and Prevention, Västerbotten County Council, Sweden

BACKGROUND:

In April 2011, we used an online questionnaire to investigate a reported increase in cases of watery diarrhoea in the city of Skellefteå, Sweden, to determine the number affected and find evidence of waterborne transmission. At that time, *Cryptosporidium* had been detected in 3 stool samples and a boil water notice was issued.

METHODS:

We conducted a retrospective cohort study among all residents of Skellefteå municipality (population=71,500). We used the media to publicise an online questionnaire about demographic characteristics, symptoms and water consumption. Parents were asked to answer for their children. Cases were persons reporting diarrhoea after April 1st 2011. Respondents reporting travel in the 2 weeks before symptom onset were excluded. We produced spot maps based on postcode of residence and performed logistic regression to analyse the dose-response relationship of water consumption.

RESULTS:

The questionnaire was published within 28 hours of the outbreak notification. In the following 12 hours we received 893 responses. After 1 week, we had received 10,208 responses, including 4,477 cases (attack rate: 44%). Spot maps produced the day after launching the questionnaire showed a high concentration of cases in the city centre. We detected a dose-response relationship for daily water consumption: the odds ratios were 1.5 (95% CI 1.0-2.3) for 1 glass, 2.7 (95% CI 1.8-4.0) for 2-5 glasses and 3.0 (95% CI 2.0-4.5) for >5 glasses (ref: <1 glass).

CONCLUSIONS:

Immediate use of a web-based questionnaire allowed us to rapidly establish that this was a very large, geographically localised outbreak and that the probable vehicle of transmission was tap water, thus supporting the decision to maintain the boil water notice even when the parasite could not be detected in drinking water.

PRESENTED BY: DR. STEPHAN STENMARK

Keywords: Outbreak, waterborne, cryptosporidium, web-based questionnaire

ESCAIDE reference number: 20110126

FOOD AND WATER BORNE DISEASE: SURVEILLANCE AND METHODS

Implementation of a syndromic surveillance for bloody diarrhoea in emergency departments to monitor new infections during the STEC/HUS outbreak in Germany, 2011

Thorsten Rieck* (1), Ben Greutèlears* (1, 2, 3), Matthias Nachtnebel* (1, 2, 3), M. Wadl (1), M. an der Heiden (1), T. Eckmanns (1), J. Benzler (1)

AFFILIATIONS:

1. Department of Infectious Disease Epidemiology, Robert Koch Institute, Berlin, Germany
2. Post Graduate Training in Applied Epidemiology, Robert Koch Institute, Berlin, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

* These authors contributed equally to this work.

BACKGROUND:

In spring 2011, Germany experienced a food-borne outbreak of Shiga-like toxin producing *Escherichia coli* (STEC)/haemolytic-uremic syndrome, mainly in the northern states. STEC-patients often present with bloody diarrhoea (BD). We implemented a voluntary syndromic surveillance in emergency departments (ED) to rapidly assess the temporal trend of the outbreak, complementing the routine surveillance system based on statutory notification by laboratories and physicians.

METHODS:

The surveillance started on May 28. Participating ED were located in all German federal states in outbreak affected and less affected areas (defined by HUS incidence in counties). Data collection covered the total number of new ED patients and the number of patients with BD by sex and age (<20 years, ≥20 years). Data were transferred daily to the RKI by email/fax. We calculated incidence-rates as proportions of patients with BD among all patients, and incidence-rate ratios for subsequent days using negative binomial regression.

RESULTS:

Overall, 185 ED participated (daily response median=96; range 5-137). As of June 30, BD was reported for 3.1% (901/28,677; range 0.4%-10.3%) of ED patients in affected areas and 0.6% (803/125,494; range 0.3%-5.6%) in less affected areas. Starting on May 30, the daily average incidence-rate in affected areas decreased significantly ($p<.001$) by 8.0% for females <20 years and 10.1% for ≥20 years, and by 9.2% for males ≥20 years; a decrease for males <20 years was not significant.

CONCLUSIONS:

A rapid roll-out of the surveillance of BD was possible. As a proxy for STEC infections, it contributed to understanding the temporal course of the STEC/HUS outbreak and supported decision-making processes. We recommend the establishment of a syndromic surveillance system for comparable outbreak situations. It can complement the routine surveillance system and make epidemiological data rapidly available.

PRESENTED BY: MR THORSTEN RIECK

Keywords: Epidemics, Sentinel Surveillance, Shiga-Toxigenic *Escherichia coli*

ESCAIDE reference number: 20110244

PARALLEL SESSION ABSTRACTS

FOOD AND WATER BORNE DISEASE: SURVEILLANCE AND METHODS

Factors influencing norovirus epidemiology in Germany: time-series analysis of norovirus surveillance data, 2001–2010

Helen Bernard (1), M. Faber (1), M. Höhne (2), K. Stark (1), M. Höhle (1)

AFFILIATIONS:

1. Robert Koch Institute, Department for Infectious Disease Epidemiology, Berlin, Germany
2. Robert Koch Institute, Department for Infectious Diseases, Berlin, Germany

BACKGROUND:

From season 2001/2002 to season 2009/2010, a total of 581,423 laboratory-confirmed cases of norovirus gastroenteritis have been reported in Germany, corresponding to seasonal incidences of 5 to 180 laboratory-confirmed cases per 100,000 population. Case numbers typically peak during the winter, but driving factors for intra- and inter-seasonal variation have not been investigated thoroughly in Germany. Our aim was to identify factors influencing norovirus epidemiology using routine surveillance data.

METHODS:

We fitted multivariate auto-regressive time-series models by adapting linear regression to the weekly logarithmic incidence of reported laboratory-confirmed norovirus cases in four age-groups (0–5, 6–17, 18–74, >74 years) by federal state. The considered time period was week 31/2001–30/2010. In addition to auto-regressive terms, investigated factors were school holidays, temperature, humidity, rainfall, virological parameters, seasonal terms and trend.

RESULTS:

In all age-groups, the weekly incidence highly depended on incidences in the preceding weeks in the same age-group. We found related incidences in adjacent age-groups and adjacent weeks of reporting. Additionally, the incidence in >74 year-olds was associated with the incidence in 0–5 year-olds in the preceding week, but not vice versa. School holidays had an inverse effect on incidences in the same week in the three youngest age-groups and to a lesser extent in >74 year-olds. Seasons with circulation of GII.4 strains were associated with higher incidences in all age-groups except 6–17 year-olds. Climatic factors did not have a consistent effect on the outcomes.

CONCLUSIONS:

Apart from virological factors, contact patterns between age-groups appear to be an important determinant of norovirus epidemiology in this analysis. In particular, infection among young children could be a driving force for disease among elderly persons, suggesting a potential starting point for prevention in child-care facilities.

PRESENTED BY: DR HELEN BERNARD

Keywords: Norovirus, surveillance, time-series analysis

ESCAIDE reference number: 20110270

FOOD AND WATER BORNE DISEASE: SURVEILLANCE AND METHODS

Detection of risk factors using employee cafeteria payment card data – Satellite-outbreak of a larger Shiga-toxin-producing *E. coli* (STEC) O104 outbreak, Frankfurt, Germany, May 2011

Hendrik Wilking (1, 2, 3), U. Götsch (4), H. Meier (5), D. Thiele (5), M. Askar (1, 2, 3), M. Dehnert (1), C. Frank (1,6), G. Krause (1), K. Stark (1), B. Böddinghaus (4), O. Bellinger (4), R. Gottschalk (4)

AFFILIATIONS:

1. Department for Infectious Disease Epidemiology, Robert Koch Institute, Berlin, Germany
2. Postgraduate Training for Applied Epidemiology (PAE), Berlin, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), Stockholm, Sweden
4. Health Protection Authority City of Frankfurt am Main, Germany
5. Veterinary Service City of Frankfurt am Main, Germany
6. Institute for Hygiene and Public Health, University of Bonn, Bonn, Germany

BACKGROUND:

In May/June 2011, a large outbreak of haemolytic-uremic syndrome (HUS) and diarrhoea caused by Shiga-toxin-producing *Escherichia coli* (STEC) O104:H4 affected mainly Northern Germany. Early investigations suggested raw salads/vegetables as vehicles. A cluster of infections occurred among employees of a company in Frankfurt/Main. We conducted an investigation among customers of two company cafeterias to find additional evidence on the vehicle of infection.

METHODS:

We obtained information on cafeteria purchase accounts from the employees' payment cards. Demography and health status information was obtained through a survey. We defined cases as employees who were either hospitalised due to STEC infection or self-reported bloody diarrhoea between 2 and 23 May 2011. For a nested case-control study we included early cases and randomly selected asymptomatic controls among cafeteria customers. Multivariable logistic regression was performed, controlling for age and sex.

RESULTS:

We identified 60 case patients (disease onset from 9 to 17 May 2011), among them 18 with HUS and nine with serotype O104:H4 confirmed. Median age was 33 years (range: 22–60) and 36/60 (60%) were female. Patients who did or did not develop HUS did not differ regarding age ($p=0.16$) or sex ($p=0.91$). In the study (including 23 cases and 35 controls), purchasing salad in the cafeteria was associated with illness (OR=6.6; 95% CI: 1.4–31.4) independently of age and sex. The purchase of main dishes, desserts and fruits were not statistically associated with the disease, neither was cafeteria location.

CONCLUSIONS:

Our results suggest that the food vehicle is a salad bar item. Even if purchase is not necessarily equivalent with eating the food, the billing information allowed for a quick investigation while avoiding exposure misclassification due to ill-remembered food purchases.

PRESENTED BY: DR HENDRIK WILKING

Keywords: Foodborne Diseases; Shiga-Toxigenic *Escherichia coli*; Disease Outbreaks; Hemolytic-Uremic Syndrome; Case-Control Studies

ESCAIDE reference number: 20110318

FOOD AND WATER BORNE DISEASE: SURVEILLANCE AND METHODS

Now-Casting during a huge outbreak of haemolytic-uremic syndrome in Germany, 2011

Matthias an der Heiden, Maria Wadl, Michael Höhle

AFFILIATIONS:

Robert Koch Institute, Berlin, Germany

BACKGROUND:

From May to July 2011, Germany was confronted with a huge outbreak of haemolytic-uremic syndrome (HUS) with 858 cases so far. Since the time delay between the date of symptom onset and the date of reporting to the Robert Koch Institute (RKI) was known to be a few days up to weeks, a sound interpretation of the epidemic curve available at the RKI on a specific day had to take into account the reporting delay. A leading question was whether or not the number of cases was still increasing.

METHODS:

Starting from 4 June, we daily extrapolated the true number of hospitalized cases. We estimated the proportion of not-yet-reported cases from the empirical cumulative distribution function (ECDF) for the time delay between hospitalization and receipt of the case information at the RKI within the last ten days. To account for variability we computed Hall-Wellner confidence bands of the ECDF and used these to form prediction intervals for the Now-Cast. Retrospectively, on basis of the complete epidemic curve, we performed a quantitative comparison of our approach and several alternative ways of estimating the ECDF.

RESULTS:

The Now-Casting on 4 June showed that the peak of the outbreak was on 21 or 22 May. This was confirmed retrospectively. In the following two weeks the Now-Casting revealed that the outbreak was still ongoing, but on a consistently reduced level.

CONCLUSIONS:

Now-Casting is a valuable tool for interpreting the epidemiological situation during an outbreak with reporting delays. The method is simple to use and can be applied in situations, where the reporting delay is predictable. An implementation of the algorithm will be made available in the R package "surveillance".

PRESENTED BY: DR MATTHIAS AN DER HEIDEN

Keywords: HUS, outbreak, surveillance, now-casting

ESCAIDE reference number: 20110352

POSTER SESSION **ABSTRACTS**



POSTER SESSION ABSTRACTS

ANTIMICROBIAL RESISTANCE

Bacterial susceptibility of *Escherichia coli* in urinary tract infections in the hospital setting

Axel Jeurissen, Sarah Cooreman, Jef Van Schaeren

AFFILIATIONS:

Department of Microbiology, GZA Hospitals Antwerp, Belgium

BACKGROUND:

Escherichia coli is the most frequent cause of urinary tract infections. Frequent use of antibiotics has put pressure on the susceptibility to antibiotics in this micro-organism. Therefore, we studied the in vitro susceptibility of *Escherichia coli* isolated from urinary tract infections in a hospital population against 5 antibiotics (fosfomycin, nitrofurantoin, trimetoprim-sulfamethoxazole, ciprofloxacin and norfloxacin).

METHODS:

E-tests were performed on 100 consecutive urinary *E. coli* isolates from 95 patients according to the manufacturer's instructions. EUCAST breakpoints were used for classification of the isolates as susceptible or resistant.

RESULTS:

The overall susceptibility of *E. coli* to fosfomycin was the highest, with 99% of the strains being in vitro susceptible. For nitrofurantoin, ciprofloxacin, norfloxacin, and co-trimoxazol susceptibility percentages were 84%, 83%, 79% and 72%, respectively.

CONCLUSIONS:

Our results demonstrate that the highest susceptibility rate of *E. coli* was found for fosfomycin. Therefore, we believe that, in our hospital setting, a single dose of fosfomycin might be acceptable as a first line therapy for urinary tract infections.

PRESENTED BY: DR AXEL JEURISSEN

Keywords: *Escherichia coli*

ESCAIDE reference number: 20110014

ANTIMICROBIAL RESISTANCE

Do Norwegian hospitals have guidelines for the use of antibiotics prior to cholecystectomies?

Oliver Kacelnik (1, 2), T. Alberg (1), H. Eriksen (1) and F. E. Skjeldestad (1)

AFFILIATIONS:

1. Norwegian Institute of Public Health, Oslo, Norway
2. Norwegian Field Epidemiology Training Programme (Nor-FETP) affiliated to the European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

BACKGROUND:

Increasing microbial resistance to antibiotics is a global problem. The presence of guidelines for antibiotic use has been shown effective to both protect individuals undergoing surgery and ensure appropriate antibiotic prescribing. Over 5000 cholecystectomies are conducted each year in Norway and there is evidence that antibiotics should be restricted to high-risk patients; however, there are no national guidelines. The aim of this study was to chart the existence of local guidelines and whether they were updated and used. This was in order to inform the Norwegian surgical community and contribute to a rational approach to antibiotic prophylaxis.

METHODS:

An online survey was sent to named consultant surgeons from every hospital conducting cholecystectomies in Norway. Most questions were closed and related to the existence, content and evaluation of any guidelines concerning prophylactic antibiotic treatment. There was also a section for free text comments.

RESULTS:

Thirty-seven of 47 (79%) hospitals responded. Overall, 16 of 37 (43%) had written guidelines; this was higher in the university hospitals (71%) than in local ones (39%). Of those with written guidelines, four hospitals advocated antibiotics to patients where evidence from meta-analyses suggest these are inappropriate. Of those with no written guidelines, surgeons mostly reported not giving antibiotics; only one hospital of this group gave to everyone.

CONCLUSIONS:

The presence and contents of guidelines varies widely. Although most hospitals appear to follow evidence-based practice, it is difficult to know what individual surgeons do in the absence of formal guidelines. We recommend the establishment of a national protocol. This would optimize rational antibiotic use, raise awareness of resistance, promote discussion and benefit the treatment of individual high-risk patients.

PRESENTED BY: DR OLIVER KACELNIK

Keywords: Antibiotic Resistance, guidelines, cholecystectomy

ESCAIDE reference number: 20110064

ANTIMICROBIAL RESISTANCE

The changing antimicrobial susceptibility of bloodstream infections in the first month of life: informing antibiotic policies for early and late onset sepsis

Ruth M Blackburn (1), N. Q. Verlander (2), P. Heath (3), B. Muller-Pebody (1)

AFFILIATIONS:

1. Healthcare Associated Infections and Antimicrobial Resistance Department, Health Protection Agency, England
2. Statistics, Modelling & Economics Department, Health Protection Agency, England
3. Child Health & Vaccine Institute, St Georges, University of London, England

BACKGROUND:

Neonatal sepsis is an important cause of morbidity, requiring immediate and effective treatment for both early (EOS; <2 days). UK empiric therapy differs with penicillin and gentamicin (PEN/GENT) recommended for EOS and flucloxacillin and gentamicin (FLU/GENT) for LOS. However, the evidence-base for the timing of EOS and LOS is insufficient and this study therefore aims to quantify the antimicrobial resistance (AMR) of neonatal bloodstream pathogens by day of life in order to help define and treat EOS and LOS.

METHODS:

Microbiological reports for bacteria isolated from neonatal blood cultures taken in England and Wales between January 2005 and December 2010 were extracted from the HPA's voluntary surveillance database. All bacteria were included. Splines were used in logistic regression models to estimate the non-linear relationship between age and AMR. Significance of confounding variables was assessed using likelihood ratio tests.

RESULTS:

There were a total of 14,077 reports of neonatal bacteraemia; 30% were from infants aged <=2 days. Resistance to PEN/GENT and FLU/GENT increased from 4% and 7%, respectively, at day 1 to a peak of 35% and 37%, respectively, at day 6; overall AMR was 20% and 25%, respectively. Exclusion of coagulase-negative staphylococci reduced AMR to <2% for both drug combinations. Inclusion of age terms derived from linear splines in logistic regression models adjusted for pathogen and reporting year was highly significant ($p<0.001$).

CONCLUSIONS:

Resistance to key empiric therapy recommendations may change later than predicted, based on current definitions of EOS and LOS. Further work is required, including determination of the influence of individual bacteria based on their clinical significance.

PRESENTED BY: MISS RUTH BLACKBURN

Keywords: Bacteremia; Anti-Bacterial Agents; Infant, Newborn

ESCAIDE reference number: 20110083

ANTIMICROBIAL RESISTANCE

Epidemiology and antimicrobial resistance profiling of *Pseudomonas aeruginosa* in a Greek University Hospital

Maria Koutsogiannou (1), E. Jelastopulu (2), E. Drougka (1), Th. Panagea (1), E. D. Anastassiou (1), I. Spiliopoulou (1), M. Christofidou (1)

AFFILIATIONS:

1. Department of Microbiology, School of Medicine, University of Patras, Greece
2. Department of Public Health, School of Medicine, University of Patras, Greece

BACKGROUND:

Pseudomonas aeruginosa is one of the most commonly-isolated nosocomial pathogen and frequently resistant to many antibiotics. The aim of this study was to assess the epidemiology, frequency and antibiotic susceptibility of *P. aeruginosa* from patients in a tertiary-care hospital.

METHODS:

During the period 2004–2007 data on 339 isolates of *P. aeruginosa* have been collected. Analysis included antimicrobial susceptibility profiling, serotyping and PFGE.

RESULTS:

P. aeruginosa was predominant in internal medicine (39.5%) and ICU (33.6%), followed by the outpatient clinics (10%), surgery (8.6%) and paediatrics (8.3%). From outpatients and surgery departments, wounds were the most common site of isolation, lower respiratory tract from ICU, urine from internal medicine, and stool from paediatrics. Resistance was observed to the following antimicrobials: carbenicillin, 68.2%, azlocillin, 64.5%, ticarcillin+clavulanic acid, 61.8%, tobramycin, 56%, ciprofloxacin, 55.8%; amikacin, 55.2%, piperacillin, 51.6%; netilmicin, 51.4%, imipenem, 46.3, aztreonam, 25.7%, ceftazidime 23.2%, colistin 0%. Isolates from ICU were significantly ($P<0.001$) more resistant to the most antibiotics than those from other clinical settings. Outpatient isolates showed significantly higher antimicrobial susceptibility than nosocomial isolates. Significant ($P<0.05$) changes in the antimicrobial resistance throughout the study period are observed for piperacillin, azlocillin, netilmicin, amikacin, imipenem and aztreonam. The most frequent serotypes were 11 (48.4%), 12 (9.7%), and 1 (8.3%). During the last years an increase of serotype 11 and a decrease of serotype 12 are observed. PFGE revealed four main clones spread in the hospital during the last two years.

CONCLUSIONS:

This study reveals very high and increasing antimicrobial resistance of *P. aeruginosa* strains in a tertiary-care hospital, mainly in nosocomial isolates, indicating thus the need of improvement in infection control programs and antimicrobial treatment management.

PRESENTED BY: DR ELENI JELASTOPULU

Keywords: *Pseudomonas aeruginosa*, antimicrobial resistance, infection control, Greece

ESCAIDE reference number: 20110089

POSTER SESSION ABSTRACTS

ANTIMICROBIAL RESISTANCE

Antimicrobial-Resistance-Monitoring in Lower Saxony (Germany): the sentinel system ARMIN

Martina Scharlach, D. Wagner, J. Dreesman, M. Pulz

AFFILIATIONS:

Governmental Institute of Public Health of Lower Saxony, Germany

BACKGROUND:

Antimicrobial resistance is one of the most important health topics in Europe. To identify regional trends of antimicrobial resistance in inpatient and outpatient care, Lower Saxony (Germany) launched the sentinel system ARMIN (Antimicrobial-Resistance-Monitoring in Lower Saxony). Currently eight laboratories participate as sentinel sites.

METHODS:

Participating laboratories contribute single case data of their microbiological results. For data transfer the laboratory statistic software HYBASE™ is used, for which a specific data interface was developed. The surveillance system uses interpreted resistance data (susceptible, intermediate, and resistant). Data sets include the specimen, information of inpatient or outpatient care and the main postal code (average population size 660,000 inhabitants). Results can be stratified according to this. Data is presented by an interactive data query in the internet. Internet access is free for specialists and public.

RESULTS:

From 2006 to 2010 eight laboratories reported 935,900 diagnostic test results. Proportion of MRSA (methicillin-resistant *Staphylococcus aureus*) among all *Staphylococcus aureus* increased from 19.5% in 2006 to 23.3% in 2010 for inpatient care in Lower Saxony. Resistance varied regionally between 16.1% and 29.0% in 2010. *Escherichia coli* resistance to Cefotaxime for inpatient care increased from 3.0% to 8.8% between 2006 and 2010 and varied regionally between 6.6% and 11.6% in 2010.

CONCLUSIONS:

Regional variation of resistance could be explained by explanatory variables such as population density, age distribution and livestock density. However laboratory specific diagnostic techniques and the use of interpreted resistance results could also be a reason for regional variation and differences to other surveillance systems. A quality circle was established to improve standardisation.

PRESENTED BY: DR MARTINA SCHARLACH

Keywords: Antimicrobial resistance

ESCAIDE reference number: 20110113

ANTIMICROBIAL RESISTANCE

Methicillin-resistant *Staphylococcus aureus* (MRSA) in a Canadian sub-Arctic community: Descriptive epidemiology from an outbreak encourages renewal of community control measures

Katie Rutledge-Taylor (1), C. Case (2), K. Kandola (2), C. Newberry (2)

AFFILIATIONS:

1. Canadian Field Epidemiology Program, Public Health Agency of Canada, Ottawa, Canada
2. Department of Health & Social Services, Government of Northwest Territories, Yellowknife, Canada

BACKGROUND:

Beginning in mid-2009, reported cases of methicillin-resistant *Staphylococcus aureus* (MRSA) increased sharply in an Aboriginal community and have persisted at elevated levels. This investigation's objective was to summarize the descriptive epidemiology of the outbreak in order to inform control measures.

METHODS:

Cases were defined as individuals with symptomatic infection and specimen collection between January 1, 2009 and May 31, 2011, whose positive laboratory result was reported to the Northwest Territories (NWT) Office of Chief Public Health Officer (OCPHO). Infections were considered distinct episodes when 8 weeks or longer had elapsed between positive cultures, or a different anatomical site was implicated. Case investigation forms, laboratory reports, hospital discharge summaries, and correspondence between OCPHO and community health staff were reviewed to obtain demographic and clinical data.

RESULTS:

One hundred and fifteen cases had 152 infections; 24 (20.9%) cases had two infections and 6 (5.2%) had three or more. The median case age was 24.5 years (range 0.8 to 79.7 years), and 62 (53.9%) were male. Seven (6.1%) were hospitalized in the 12 months prior to infection. Skin and soft tissue infections (SSTI) were most common (n=129, 84.9%) and usually (n=111, 86.0%) treated with systemic antibiotics.

CONCLUSIONS:

The few cases with history of hospitalization, the ongoing incidence of new infections, and the number of cases with repeat infections imply insufficient infection control in the community. Promising household infection control measures, including additional water deliveries and "home cleaning kits," initiated early in the outbreak, should be renewed. The proportion of SSTI treated with antibiotics supports the need for a shift in clinical practice norms: the newest Territorial guidelines, issued in March 2011, recommend conservative treatment without antibiotics for uncomplicated MRSA SSTI.

PRESENTED BY: MS KATIE RUTLEDGE-TAYLOR

Keywords: Indians, North American; antimicrobial drug resistance; *Staphylococcus*; transmission

ESCAIDE reference number: 20110198

ANTIMICROBIAL RESISTANCE

Cases of community-acquired meticillin-resistant *Staphylococcus aureus* in an asylum seekers centre in Northern Germany, November 2010

Sandra Dudareva (1, 2), A. Barth (3), K. Paeth (3), A. Krenz-Weinreich (4), F. Layer (5), Y. Deleré (6) T. Eckmanns (6)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Postgraduate Training for Applied Epidemiology (PAE, German FETP), Robert Koch-Institute, Berlin, Germany
3. Public Health Department, City of Neumünster, Germany
4. Private practice Dres. Krenz-Weinreich and Schulze, Plön, Germany
5. National Reference Centre for Staphylococci, Robert Koch Institute, Wernigerode, Germany
6. Department for Infectious Disease Epidemiology, Robert Koch Institute, Berlin, Germany

BACKGROUND:

In mid-November 2010, a 19 year-old woman originating from Somalia was diagnosed with a furuncle caused by a Panton-Valentine leukocidine (PVL)-positive community-acquired meticillin-resistant *Staphylococcus aureus* (CA-MRSA) in an asylum seeker centre in Northern Germany. On the same day, she was moved from a four-bed room to isolation with separate bathroom and toilet. In order to identify further cases and to stop possible transmission of PVL-positive CA-MRSA, we decided to perform active case finding.

METHODS:

We collected nasal swabs from contacts of the identified person and other accessible residents of the centre. Collected samples were sent for bacterial culture; *Staphylococcus aureus* were tested for antibiotic resistance. Identified MRSA-strains were further characterised by PVL- and spa-typing. Persons colonised by PVL-positive CA-MRSA had to follow a stringent decolonisation plan. Its success was determined by testing nasal swabs after three and six days, and 12 months. After the first negative test the resident could be relocated to other centres where further testing was performed.

RESULTS:

Altogether, 427 persons from 18 nations resided in the centre. Median age was 23 years, male/ female ratio 1.5. Samples were collected from 54% (232/427); five persons were positive for MRSA. Of those, three were PVL-positive CA-MRSA. All three were different in respect of the resistance pattern. Two isolates (from 4 and 8 years old siblings from Serbia) were assigned to spa-type to44, the initial case presented spa-type to21. All three cases reached negative test three days after the decolonisation.

CONCLUSIONS:

No transmission was identified in this setting. However, asylum seeker centres are settings where the appearance of PVL-positive CA-MRSA should be treated with special attention; protocols and national guidelines for the decolonisation should be developed.

PRESENTED BY: MS SANDRA DUDAREVA

Keywords: Meticillin-resistant *Staphylococcus aureus*, Panton-Valentine leukocidine, asylum seeker centre

ESCAIDE reference number: 20110240

ANTIMICROBIAL RESISTANCE

Male urinary tract infections in Dutch general practices

C. D. J. den Heijer (1), M. van Dongen (2), G. A. Donker (3), J. Maes (1) and E. E. Stobberingh (1)

AFFILIATIONS:

1. Department of Medical Microbiology, Maastricht University Medical Centre/CAPHRI, Maastricht, The Netherlands
2. Department of Epidemiology, Maastricht University Medical Centre, Maastricht, The Netherlands
3. NIVEL, The Netherlands Institute for Health Services Research, Utrecht, The Netherlands

BACKGROUND:

With acknowledged differences between female and male UTIs, it is equally important to regularly evaluate the *Escherichia coli* antimicrobial susceptibility and therapeutic policy for UTIs in men to control antimicrobial resistance. We determined antibiotic prescription rates for male UTIs in Dutch general practices, and the antibiotic susceptibility (including extended-spectrum beta-lactamases (ESBL)) of uropathogenic *E. coli*. Results were compared with data from a similar 2004 study.

METHODS:

From January 2009 to December 2010, 42 GPs collected urinary samples from male patients (≥ 12 years) with symptoms indicative of UTI and recorded prescribed antimicrobial treatment. Uropathogens were identified and antibiotic susceptibility of *E. coli* was determined. A P-value ≤ 0.05 was considered statistically significant in comparing the current and 2004 study.

RESULTS:

545 urinary samples were collected, of which 351 (64%) were positive ($\geq 10^3$ cfu/mL). *E. coli* was most commonly isolated (50%). High susceptibility rates were observed to fluoroquinolones and co-amoxiclav (95% and 89% respectively), whereas amoxicillin (67%), trimethoprim (77%) and co-trimoxazole (77%) showed lower rates. One ESBL (0.6%) was found. There were no differences with the susceptibility data from 2004 (all $P > 0.05$). Antibiotic prescription data were available from 524 patients, of which 324 (62%) were empirically treated. Fluoroquinolones (28%) and co-amoxiclav (27%) showed highest prescription rates followed by nitrofurantoin (22%) and co-trimoxazole (15%). Co-amoxiclav prescription rates increased (11% vs 27%, $P < 0.05$) and co-trimoxazole rates decreased (24% vs 15%, $P < 0.05$) over time.

CONCLUSIONS:

For male UTIs no significant differences were observed in *E. coli* susceptibility over a 5-year period. ESBL prevalence was low. Differences in prescription rates over time were in accordance with observed susceptibility rates. Regular surveillances remain necessary to update clinical guidelines and control antimicrobial resistance.

PRESENTED BY: MR CASPER DEN HEIJER

Keywords: Urinary tract infections, male, *Escherichia coli*, antibiotic prescriptions, general practices

ESCAIDE reference number: 20110276

POSTER SESSION ABSTRACTS

ANTIMICROBIAL RESISTANCE

Investigation of high-level resistance to multiple-aminoglycosides in clinical isolates of Enterobacteriaceae in Poland

Katarzyna Piekarska (1), K. Zacharczuk (1), A. Januszkiewicz (1), M. Rzczkowska (1) R. Gierczyński, E. Bareja (2), M. Olak (2)

AFFILIATIONS:

1. Department of Bacteriology, National Institute of Public Health – National Institute of Hygiene, Warsaw, Poland
2. Military Institute of Medicine, Warsaw, Poland

BACKGROUND:

The aim of this study was to investigate the occurrence of 16S rRNA methylases, that conferred high-level aminoglycoside resistance in clinical isolates of Enterobacteriaceae from a regular hospital in Warsaw, Poland.

METHODS:

A total of 1770 Enterobacteriaceae isolates collected from 19 April to 19 September in 2010 in regular hospital in Poland were screened for the resistance to aminoglycosides using the automatic Vitek System 2 (bioMérieux, France). The strains which were resistant to at least two aminoglycosides were subjected for further investigation. The MICs of gentamicin, amikacin, kanamycin, were determined by a serial double-dilution method. The presence of armA, rmtA, rmtB, rmtC and npmA genes were investigated by PCR. To determine the clonality of the tested isolates PFGE with the XbaI was performed.

RESULTS:

Among 1770 Enterobacteriaceae isolates, 113 were resistant to at least two aminoglycosides. In these selected group twenty isolates were high-level-resistant to gentamicin, amikacin and kanamycin. This group encompassed *Enterobacter cloacae* (n=15), *Klebsiella pneumoniae* (n=3), *Proteus mirabilis* (n=1) and *Serratia marcescens* (n=1) isolates. All isolates except one had ≥ 1024 µg/ml MICs for kanamycin and amikacin. The MICs of gentamicin were ranged from 64 to ≥ 1024 µg/ml. All 20 highly resistant isolates were found to carry armA gene. No specific amplification products for: rmtA, rmtB, rmtC and npmA genes were detected in tested isolates. Eighteen of twenty tested isolates were typable by PFGE. Among these isolates, 15 different PFGE-XbaI profiles were distinguished.

CONCLUSIONS:

Our results indicate that high-level resistance to multiple-aminoglycosides in clinical isolates of Enterobacteriaceae was conferred by ArmA 16S rRNA methylase.

PRESENTED BY: MS KATARZYNA ZACHARCZUK

Keywords: Aminoglycosides, 16S r RNA methylases, Enterobacteriaceae, antimicrobial resistance

ESCAIDE reference number: 20110291

ANTIMICROBIAL RESISTANCE

Fluoroquinolones use in French hospitals in 2008 and 2009. Data from the nationwide network "ATB-RAISIN".

Catherine Dumartin (1, 2), A. M. Rogues (1, 2), F. l'heriteau (3), M. Pefau (2), X. Bertrand (4), P. Jarno (5), S. Boussat (4), A. Savey (6), A. Carbonne (3), P. Angora (5), L. Lacave (3), K. Saby (4), A. Machut (6), S. Alfandari (7), B. Schlemmer (8), S. To

AFFILIATIONS:

1. Unité INSERM 657, University Bordeaux 2, Bordeaux, France
2. Southwest Regional Centre for healthcare associated infections Control, Bordeaux, France.
3. Paris and North Regional Centre for healthcare associated infections Control, Paris, France.
4. East Regional Centre for healthcare associated infections Control, Nancy, France.
5. West Regional Centre for healthcare associated infections Control, Rennes, France.
6. South-East Regional Centre for healthcare associated infections Control, Lyon, France.
7. French Infectious Diseases Society (SPIIF).
8. President of the National Committee for prudent use of antibiotics.
9. Pharmacy, CHU St-Louis, Paris, France.
10. Public Health Institute (InVS), St-Maurice, France

BACKGROUND:

Fluoroquinolones, widely used in French hospitals, are known to promote bacterial resistance. We performed nationwide surveys in 2008 and 2009 to study fluoroquinolone use, to provide a tool for benchmarking and to identify areas for improvement.

METHODS:

Antibiotics for systemic use were surveyed according to the national surveillance network ATB-RAISIN. Antibiotic consumption for inpatients, expressed in number of defined daily doses (DDD) per 1000 patients-days (PD); number of PD and of beds by clinical activity: medicine, surgery, intensive care unit (ICU), gynaecology, rehabilitation, long-term care, were retrospectively collected by voluntary hospitals.

RESULTS:

Fluoroquinolone use was 53 DDD/1000 PD each year in 861 hospitals in 2008 and in 997 in 2009, accounting for around 14.5% of total antibiotic use. In 736 hospitals participating each year, levofloxacin use was 10 DDD/1000 PD in 2008 and 11 in 2009, with highest increase in tertiary/secondary hospitals. Fluoroquinolone use varied according to clinical activity: 13 DDD/1000 PD in gynaecology and 212 in ICUs in 2009. Fluoroquinolone use varied according to ICU size suggesting differences in patient case-mix: median levofloxacin use was 67, 57 and 35 DDD/1000 PD in ICUs with less than 10 beds, with 10 to 15 beds and with more than 15 beds respectively.

CONCLUSIONS:

This national yearly survey provided detailed information on fluoroquinolone use trends. Total fluoroquinolone use remained stable with a slight increase in levofloxacin use. Fluoroquinolone use in French acute care wards did not seem higher than that reported in the Netherlands (96 DDD/1000 bed-days, 16.5% of total antibiotic use in 2008) and in Denmark (100 DDD/1000 bed-days, 13% of total antibiotic use in 2009). Trends towards higher use of levofloxacin and variations among ICUs need further investigation.

PRESENTED BY: DR CATHERINE DUMARTIN

Keywords: Antibiotic use, surveillance network, hospitals

ESCAIDE reference number: 20110327

APPROACHES IN OUTBREAK INVESTIGATION, ANALYSIS, COMMUNICATION AND COORDINATION

Evaluating the Usefulness of Computer Supported Outbreak Detection

A-M Kling (1), M Grünewald (1), Kenneth Hebbing (1) and A Hulth (1)

AFFILIATIONS:

Swedish Institute for Communicable Disease Control, Stockholm, Sweden.

BACKGROUND:

Computer Assisted Search for Epidemics (CASE) is a framework for computer supported outbreak detection, developed and in use at the Swedish Institute for Communicable Disease Control (SMI). Currently, nine epidemiologists receive automatically generated signals from CASE for the surveillance of 40 diseases/subtypes. The CASE project group consists of two statisticians, a system developer and a project leader. The group works closely with the epidemiologists at SMI, discussing possible interpretations of CASE signals and how the system can be tailored to better meet their specific needs. Here we present an evaluation of the usefulness of CASE from the epidemiologists' perspective.

METHODS:

A web based questionnaire with thirteen questions about the usefulness of CASE was sent to all epidemiologists using CASE at SMI (n=9).

RESULTS:

The survey had a 100% response rate. The epidemiologists all agreed that CASE verifies signals seen in their basic surveillance work. Seven out of nine stated that CASE saves time in their daily work. Five out of nine stated that they had been made aware of an outbreak by CASE on at least one occasion. These five epidemiologists are responsible for the surveillance of sexually transmitted infections (n=3) and antibiotic resistant bacteria (n=2).

CONCLUSIONS:

Our evaluation shows that CASE is a useful and important tool in routine surveillance work for the epidemiologists at the institute. We believe there are several reasons for this success. One is the flexibility of CASE, which allows for different parameter settings for different diseases. Other reasons are the close collaboration between the CASE group and the epidemiologists and the continuous development of the system where it is adapted to the actual needs of the epidemiologists in charge of surveillance.

PRESENTED BY: MS ANNA-MARIA KLING

Keywords: Decision Making, Computer-Assisted Evaluation, Infectious Disease Outbreaks

ESCAIDE reference number: 20110026

APPROACHES IN OUTBREAK INVESTIGATION, ANALYSIS, COMMUNICATION AND COORDINATION

A repeated control-survey as extension of public health surveillance

IHM Friesema, W van Pelt

AFFILIATIONS:

Epidemiology and Surveillance, Centre for Infectious Disease Control, National Institute of Public Health and the Environment (RIVM), Bilthoven, the Netherlands

BACKGROUND:

Public health surveillance is a significant tool for monitoring infectious diseases. For the identification of risk factors for development of a specific infection, comparison between cases and non-cases is necessary. In 2008, a control-survey was started in the Netherlands for an indefinite period of time.

METHODS:

A questionnaire is sent to about three samples of the general population each year containing similar questions as the questionnaires used for cases with a selected group of gastroenteritis, especially foodborne infections, and respiratory infections.

RESULTS:

Between July 2008 and December 2010, 2,880 questionnaires were mailed. Overall response was 35.4%. Response was affected by gender, age, living in a large city, and both parents born outside the Netherlands. The collected data from the general population were each year compared with the sporadic cases of listeriosis and Shiga toxin-producing *Escherichia coli* infections in the same year, yielding insights in risk groups and risk factors. In the near future, the control-survey will be used for more infections, for example legionellosis and psittacosis. One sending could also be used as timely substitute for the normal case-control study during a Salmonella outbreak. Furthermore, it offers the opportunity to follow temporal and permanent changes in habits, food consumption and activities within the general population.

CONCLUSIONS:

Extension of the surveillance with a control-survey yields insights in risk groups and risk factors for sporadic cases, and can be an effective and timely substitute for the normal case-control study during an outbreak. Nevertheless, the possible effect of nonresponse bias should always be kept in mind, and where possible should be accounted for in the analyses by matching or correction.

PRESENTED BY: DR INGRID FRIESEMA

Keywords: Public health surveillance; Community surveys; Gastroenteritis; Respiratory tract infections; Disease outbreaks

ESCAIDE reference number: 20110043

POSTER SESSION ABSTRACTS

APPROACHES IN OUTBREAK INVESTIGATION, ANALYSIS, COMMUNICATION AND COORDINATION

The piloting of an Oral Fluid surveillance system for pertussis in England and Wales

Helen Campbell (1), NK Fry (2), D Litt (2), TG Harrison (2), G Amirthal-ingam (1), E Miller (1)

AFFILIATIONS:

1. Department of Immunisation, Hepatitis and Blood Safety, HPA Health Protection Services, London.
2. Respiratory and Systemic Infection Laboratory, HPA Microbiology Services Division, London.

BACKGROUND:

Pertussis surveillance through existing methods is incomplete, particularly in non-infant cases who usually suffer milder disease without classic symptoms but who can infect vulnerable infants. An oral fluid (OF) service was piloted throughout England and Wales to determine its value as an additional surveillance tool for pertussis.

METHODS:

The OF assay was developed as a surrogate for the standard serum antibody assay: both estimate anti-pertussis toxin IgG antibody. The OF assay has lower sensitivity (approximately 80% compared to serology) but offers simple, non-invasive sample collection. Between June 2007 and August 2009 OF test kits were sent to all clinically notified pertussis cases not already confirmed by other laboratory tests (culture, PCR, serology). Kits were returned to the National Respiratory and Systemic Infection Laboratory for testing. National data on laboratory confirmed pertussis by test method and age and statutory notifications based on clinical diagnosis were analysed in time periods before and during the pilot.

RESULTS:

1602 OF samples were received and 41% tested positive; increasing laboratory ascertainment of pertussis by 32%. During the pilot, 54% and 36% of laboratory confirmed cases in 1–9 and 10–14 year olds respectively were confirmed by OF testing only. There was evidence that OF confirmed cases were appropriately notified before sample collection, whereas cases confirmed by other methods were notified after they had been confirmed. There was no overall difference in age profile and disease severity of cases before and during the OF pilot period.

CONCLUSIONS:

OF testing of clinically diagnosed pertussis cases was well-accepted by patients and health professionals and encouraged appropriate notification practice. The OF assay is a useful additional surveillance tool, improving case ascertainment in young children and adolescents in particular.

PRESENTED BY: MS HELEN CAMPBELL

Keywords: Whooping cough, *Bordetella pertussis*, epidemiology, population surveillance

ESCAIDE reference number: 20110051

APPROACHES IN OUTBREAK INVESTIGATION, ANALYSIS, COMMUNICATION AND COORDINATION

A readily available software tool as alternative to web-based questionnaires

Benedikt Greutelaers (1, 2, 3), S Dudareva (1, 2, 3), K Alpers (1, 2, 3)

AFFILIATIONS:

1. Department of Infectious Disease Epidemiology, Robert Koch-Institute, Berlin, Germany
2. Post Graduate Training in Applied Epidemiology, Robert Koch-Institute, Berlin, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

BACKGROUND:

Web-based questionnaires as tools in outbreak investigations are becoming increasingly popular as they save time and resources and usually have a good response. Yet, most of available software tools do not offer data ownership as data is usually stored on the providers' server. Furthermore, rapid implementation of such tools in an outbreak situation can be difficult due to data protection and administrative issues. This abstract aims to present an electronic alternative to web-based questionnaires.

METHODS:

In the investigation of an outbreak of gastroenteritis among physicians attending a hygiene training course in Berlin, we used Adobe Acrobat ProTM to generate an interactive questionnaire and distributed it via e-mail, as e-mail addresses of all participants were available. Filled-in and returned questionnaires were imported in an Adobe Acrobat response file (line list) from where it was possible to export the data for analysis.

RESULTS:

The preparation of an interactive questionnaire comprising four pages took 3 hours. From a total of 42 participants, 36 (86%) returned a filled-in questionnaire within 7 days. Twenty-nine participants (81%) completed all questions on any food consumption of whom 18 (62%) completed all questions on portion size. The median age of study participants was 39 years (range 28–60 years).

CONCLUSIONS:

The distribution of a questionnaire via e-mail through Adobe Acrobat ProTM was a rapid and very efficient method allowing for a high response and completeness. Adobe Acrobat ProTM does not raise data ownership issues and is often readily available, yet data reception via email is not anonymous. This software can offer a practical alternative to web-based questionnaires in outbreak situations when e-mail addresses are available and the target population is considered to be computer-literate..

PRESENTED BY: MR BENEDIKT GREUTÉLAERS

Keywords: Disease outbreaks, methods, internet, questionnaires

ESCAIDE reference number: 20110066

APPROACHES IN OUTBREAK INVESTIGATION, ANALYSIS, COMMUNICATION AND COORDINATION

An outbreak of *Salmonella* Enteritidis involves international cooperation and raises the question of destination-based registers

O Kacelnik (1, 2) (oliverkacelnik@gmail.com), M Kjeldsen (3), L Vold (1)

AFFILIATIONS:

1. Norwegian Institute of Public Health, Oslo, Norway
2. Norwegian Field Epidemiology Training Programme (Nor-FETP) affiliated to the European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
3. Statens Serum Institut, Denmark

BACKGROUND:

In 2011, Danish public health authorities published information via the Epidemic Intelligence Information System (EPIIS) about an outbreak of salmonellosis in Puerto Rico, Gran-Canaria. In Norway, salmonellosis is notifiable to the Norwegian Surveillance System for Communicable Diseases (MSIS) including details about country and region of infection. Based on common travel patterns among Scandinavians, we initiated a study to find out if Norway had any related cases.

METHODS:

We identified potential cases using entries in MSIS where country of infection was Spain irrespective of region and interviewed them. A case was any person reported to MSIS due to *S. Enteritidis* infection with symptom onset in November/December 2010, having visited Puerto Rico, and registered as having contracted the infection in Spain. Strains were sent to Denmark for genotyping with MLVA.

RESULTS:

There were 13 entries with *S. Enteritidis* in MSIS from the Canary islands (November/December), however none stated which island and interviews revealed five more people that were only registered as Spain. Ten had visited Puerto Rico (classified as cases), and six had stayed at the same all-inclusive hotel. Only one Norwegian case had a strain matching the original Danish MLVA-cluster and none could be linked epidemiologically to the Danish cases.

CONCLUSIONS:

Thanks to the international alert, the Spanish authorities were informed of an outbreak that wouldn't have been detected locally. However, EPIIS is based on recognised outbreaks. Hotels cater for tourists from different countries, if the numbers from each are low and registration incomplete the chance of missing outbreaks is high. This highlights the potential for both: improvements to MSIS travel registration and a system of detection of outbreaks in tourists based on travel history – not land of origin.

PRESENTED BY: DR OLIVER KACELNIK

Keywords: Outbreak, Register, Salmonella

ESCAIDE reference number: 20110069

APPROACHES IN OUTBREAK INVESTIGATION, ANALYSIS, COMMUNICATION AND COORDINATION

Patient movement and room placement in a Canadian multi-hospital *Clostridium difficile* outbreak

Freda Lam (1)(2), M. Helferty (1), M. Baikie (3), M. MacLean (4), Y. Hussein (4) and D. Lahey (4)

AFFILIATIONS:

1. Canadian Field Epidemiology Program, Public Health Agency of Canada, Ottawa, Ontario, Canada
2. Ontario Agency for Health Protection and Promotion, Toronto, Ontario, Canada
3. Nova Scotia Department of Health and Wellness, Halifax, Nova Scotia, Canada
4. Cape Breton District Health Authority, Sydney, Nova Scotia, Canada

BACKGROUND:

Clostridium difficile infection (CDI) is a significant cause of health-care-associated diarrhea. Its transmission can be mitigated by limiting patient movement and isolating infected patient in private rooms. Between January 1 and May 6, 2011, a multi-hospital CDI outbreak occurred in Cape Breton, Nova Scotia, Canada, where patient movement and room type were suspected as mechanisms of transmission. This study examined patient movement in and between the hospitals and its effect on CDI transmission.

METHODS:

Patient movement records were collected among all hospital-acquired CDI cases (HA-CDI). Social-network analysis was used to identify common rooms among cases. Common rooms were further selected by examining whether a case had been hospitalized there prior to laboratory confirmation. Finally, pulsed-field gel electrophoresis (PFGE) typing was used to support the presence of HA-CDI transmission.

RESULTS:

Forty-nine HA-CDI cases were identified in the outbreak period. Ninety-eight percent of HA-CDI cases' movement records were available, of which 58% had PFGE results. Eighty-six rooms in five hospitals were identified as common, but only 16 rooms (19%) in two hospitals were potential common transmission settings. Environmental transmission may have occurred in hospital A where two patients with stays after another in a private room became cases with the same PFGE pattern. Person-to-person transmission may have occurred in hospital B, where cases with overlapping stay in a ward had the same PFGE pattern. Transmission of HA-CDI between hospitals may have occurred as a case stayed at both hospitals during the two hospitals' outbreak.

CONCLUSIONS:

Patient movement evidence supports that environmental and person-to-person transmission may have contributed to HA-CDI transmission in this outbreak. Whenever possible, limiting patient movement and preventing further environmental contamination remain important factors for controlling CDI outbreaks.

PRESENTED BY: MS FREDA LAM

Keywords: *Clostridium difficile*, disease outbreaks, infection control, infectious disease transmission

ESCAIDE reference number: 20110072

POSTER SESSION ABSTRACTS

APPROACHES IN OUTBREAK INVESTIGATION, ANALYSIS, COMMUNICATION AND COORDINATION

National outbreak of Salmonella Java Phage Type 3b var9 infection using parallel case-control and case-case study designs

Naomi Launders, Chris Lane, George Kafatos, Bob Adak

AFFILIATIONS:

HealthProtection Agency, England

BACKGROUND:

Between July and October 2010, 130 cases of non travel-related human isolates of Salmonella Java PT 3b var9 were reported in the UK, compared to 5 in 2009 and 1 in 2008. Most cases were female with a median age of 39.5 (interquartile range: 24–53), living in London, South East and East of England.

METHODS:

Twelve cases were interviewed with a trawling questionnaire to develop hypotheses for disease transmission. Parallel case-control and case-case study designs were undertaken to test different aspects of the hypotheses. The case-case study examined if the infection was associated with eating away from home, while the case-control study examined if the infection was associated with specific food items eaten away from the home. The case-case study reference group were non-travel related cases of *S. Enteritidis* infected during the same time period as the cases. The case-control study recruited case nominated controls.

RESULTS:

The case-control and case-case studies were analysed separately. No significant associations were identified in the case-control study analyses. Multivariable analysis from the case-case study demonstrated a significant association between infection with the *S. Java* PT 3b var9 and eating salad leaves at a take away or consuming salad leaves at home.

CONCLUSIONS:

Epidemiological investigations are compatible with salad vegetables as the potential source of infection. Limitations in the case control study highlight the potential value of using a combination of epidemiological methods to investigate outbreaks.

PRESENTED BY: DR MAYA GOBIN

Keywords: *S. Java*; Case Case Study

ESCAIDE reference number: 20110122

APPROACHES IN OUTBREAK INVESTIGATION, ANALYSIS, COMMUNICATION AND COORDINATION

An experimental collaborative platform for the early detection of CBRN threats: the GHSI Early Alerting and Reporting Project

F. Riccardo (1); M. G. Dente (1); M. Shigematsu (2); M. Barker (3); B. Doherty (4); J. Linge (4); M. Hiley (5); S. Declich (1); G. Thinius (6); N. Lightfoot (7) on behalf of the GHSI EAR workgroup

AFFILIATIONS:

1. Centre for Epidemiology, Surveillance and Health Promotion, Istituto Superiore di Sanità (ISS National Institute of Health), Italy;
2. Infectious Disease Surveillance Center, National Institute of Infectious Diseases, Japan
3. Medical Intelligence, Health Protection Agency, UK
4. Institute for the Protection and Security of the Citizen (IPSC), Joint Research Centre, European Commission
5. Special Projects, Health Protection Agency, UK;
6. Health Threat Unit, European Commission;
7. Special Advisor Global Health Security Initiative, Department of Health, UK

BACKGROUND:

Early in the 21st Century events such as growing population mobility and terrorist attacks marked the way many countries think about security and health. In November 2001, the Health Ministers of G7 countries plus Mexico, the EU Health Commissioner and the Director General of WHO set up an informal partnership, the Global Health Security Initiative (GHSI), to collectively reduce the potential health impact of biological, chemical and radio-nuclear (CBRN) terrorism and pandemic influenza. Within this initiative, the EAR Project developed a pilot platform for CBRN risk detection that filters signals from seven epidemic intelligence platforms (ARGUS, BioCaster, GP HIN, HealthMap, MedISys, ProMED and PULS) to prove collaboration effectiveness. Detection and assessment of potential events was performed on a rotation basis by subject matter experts from all the countries involved and ECDC.

METHODS:

The CBRN platform was tested from the 5th of July to the 27th of September 2010, focusing on biological threats due to the prevailing expertise of experts working in the project.

RESULTS:

Three alerts were reported. All were on potential hoaxes and were issued in order to discredit false information circulating that could generate undue alarm. No intentional CBRN events took place during the pilot period and no false alarms were issued by the system. 55% of analysts had no previous knowledge through other sources of any of the articles/events selected by the platform and 45% referred having used the reports from the platform to make decisions or take further action within their institutions during their duty week.

CONCLUSIONS:

GHSI EAR is a unique collaborative experience that has shown promising results. It is a proof of concept that large-scale inter-country partnerships are feasible in the field of CBRN threat detection and assessment.

PRESENTED BY: DR FLAVIA RICCARDO

Keywords: CBRN; threat detection and assessment; GHSI

ESCAIDE reference number: 20110232

APPROACHES IN OUTBREAK INVESTIGATION, ANALYSIS, COMMUNICATION AND COORDINATION

The IT of EAN: a digital toolbox to manage an epidemiological community

F. Burckhardt, C.J. Williams, H. Bernard, A. Lenglet, M. Rondy, L. Pezzoli

AFFILIATIONS:

Epiet Alumni Association

BACKGROUND:

The EPIET Alumni Network (EAN) helps develop and maintain a network of European public health epidemiologists that have participated in the European Programme for Intervention Epidemiology Training or other European Field Epidemiology Training Programmes. The information technology (IT) system of the EAN was established to support the EAN board in the management of the association and to be a resource for EAN members.

METHODS:

The IT infrastructure of EAN was assessed in 2009 and 2011. A convenience sample of IT-experts was consulted and internet hosting companies were compared for technical services offered and pricing.

RESULTS:

Following the assessment, the previously static website was completely rewritten into a dynamic one (www.epietalum.net, hosted by siteground.com) based on the Drupal system, allowing online content creation and eschewing uploading static pages. Costs declined from 420€ to 60€ a year, time for posting information decreased from days to minutes. The new website includes the limesurvey online questionnaire service which was offered to EAN members in March 2010. A new assessment in spring 2011 led to migration of member data from unencrypted GoogleDocs to encrypted Wuala cloud storage and to integration of CiviCRM community management tools for processing membership fees. EAN uses Gmail for its communication. Drupal, Limesurvey and CiviCRM are free open source. The website is maintained by one board member.

CONCLUSIONS:

A collection of specialised IT allows efficient management of EAN membership and services to its members, especially in the light of growing membership. Regular needs assessments of the boards allow adaption of new technologies such as cloud storage or online payment processing (planned). EAN should recruit more technical staff from its members for IT support.

PRESENTED BY: MR FLORIAN BURCKHARDT

Keywords: Information technology, EAN, online questionnaires, website

ESCAIDE reference number: 20110233

APPROACHES IN OUTBREAK INVESTIGATION, ANALYSIS, COMMUNICATION AND COORDINATION

Rapid detection and communication of Swedish cases provided early puzzle pieces in the German STEC O104 outbreak

Sofie Ivarsson (1), C. Jernberg (1), B. Björkholm (1), I. Hedenström (1), G. Lopez (1), Regional Investigation Team (2)

AFFILIATIONS:

1. Department of Preparedness, Swedish Institute for Communicable Disease Control, Solna, Sweden
2. County Medical Offices, Sweden

BACKGROUND:

From May 2011, one of the largest outbreaks of STEC and HUS shook Europe. Sweden reported the highest number of cases outside Germany. The characteristics of the Swedish cases with respect to age, seriousness of disease and outcome makes this outbreak unique also in Swedish history.

METHODS:

Swedish STEC outbreak cases were identified and further characterized epidemiologically and microbiologically according to the EU outbreak case definition. Clinicians and laboratories were urged to enhance surveillance and sampling of suspected STEC patients with a travel history to Germany. All cases were interviewed by the County Medical Offices regarding travel and food intake in Germany. A cohort study was performed on a cluster of cases that had stayed in the same hotel in the north of Germany. All information was continuously communicated to the German authorities.

RESULTS:

As of 7 July, 53 Swedish cases had been identified including 18 (34%) HUS cases and one death. All except two secondary cases and one domestic case had been travelling in the north of Germany (median incubation period of 7 days (2–18)). Among the diarrhoea cases 65% were men, whereas among the HUS cases 78% were women. All cases were healthy adults above 20 years of age. Several clusters were identified at German restaurants and hotels. The cohort study did not show any significant risk associated with a food item.

CONCLUSIONS:

Sweden's sensitive and timely web-based surveillance system enabled a rapid response to the German outbreak alert using the international communication channels. Swedish cases provided early puzzle pieces to the German investigation as well as to our own understanding of this serious and intricate outbreak.

PRESENTED BY: MS SOFIE IVARSSON

Keywords: STEC, HUS, outbreak, Sweden, O104

ESCAIDE reference number: 20110257

POSTER SESSION ABSTRACTS

APPROACHES IN OUTBREAK INVESTIGATION, ANALYSIS, COMMUNICATION AND COORDINATION

Tested Guidelines for better response to biological incidents

Werner Espelage (1), K. Bradt (2), S. O. Brockmann (3), S. Koblinger (4), M. Lee (1), G. Meilicke (1), I. Piechotowski (5), K. Schenkel (6), F. Werner (2), Gaby Zeck (2)

AFFILIATIONS:

1. Robert Koch-Institut, Informationsstelle des Bundes für Biologische Sicherheit, Berlin
2. Landesinstitut für Gesundheit und Arbeit des Landes Nordrhein-Westfalen, Münster
3. Landratsamt Reutlingen, Kreisgesundheitsamt
4. Landeshauptstadt München, Referat für Gesundheit und Umwelt, Abteilung Gesundheitsschutz
5. Landesgesundheitsamt Baden-Württemberg im Regierungspräsidium Stuttgart
6. Bezirksamt Mitte von Berlin, Gesundheitsamt

BACKGROUND:

According to the German Protection against Infection Act (Infektionsschutzgesetz), local health authorities (LHA) are in charge of responding to biological incidents. We aimed to assess the preparedness of LHA regarding the management of biological threats in order to improve training and support from national and regional public health institutes.

METHODS:

We established a project group with public health experts from the local, regional and national level. A questionnaire was developed and disseminated to all LHA in Germany. Part of the questions focused on preparedness planning and the use of guidelines in the last 5 years. Open questions were included to collect any other suggestions and comments from LHA.

RESULTS:

A completed questionnaire was returned from 282/383 (74%) LHA in Germany. Guidelines are widely used by LHA in Germany. A high proportion of available guidelines for more common tasks like „outbreak investigation (103/157)“, „contact tracing (144/215)“ and „isolation of patients“ (107/187) were field-tested, e.g. during the influenza pandemic 2009. A lower proportion of guidelines for rare occurring scenarios such as „imported highly contagious diseases“ (38/188) or “white powder” (10/186) were tested in simulation exercises. In the comments, several LHA asked the Robert Koch Institute (RKI) to coordinate development of guidelines.

CONCLUSIONS:

In order to be better prepared for the management of biological incidents at the local level, guidelines should be tested, evaluated and improved continuously. Outbreak control teams should field-test guidelines where appropriate. In addition, simulation exercises (e.g. table top) are necessary to test guidelines for rare tasks and scenarios. RKI could coordinate regular updating of guidelines and make current versions available to LHA centrally. Coordination of a similar process at the EU level is considered important.

PRESENTED BY: DR WERNER ESPELAGE

Keywords: Public Health, Biohazard Release, Civil Defense, Disaster Planning, Guideline

ESCAIDE reference number: 20110280

APPROACHES IN OUTBREAK INVESTIGATION, ANALYSIS, COMMUNICATION AND COORDINATION

Outbreak investigation reports in Spain: are we doing enough?

Haebere M (1), Simón Soria F (2)

AFFILIATIONS:

1. Spanish FETP (PEAC), Centro Nacional de Epidemiología, Instituto de Salud Carlos III, Spain.
2. Head of Department, Disease dynamics and applied training, Centro Nacional de Epidemiología, Instituto de Salud Carlos III, Spain.

BACKGROUND:

One of the main objectives of outbreak investigations is to communicate results. Reports help increasing the knowledge about management of public-health problems, influencing national policies, improving surveillance-systems and technical skills of epidemiologists. In order to make a diagnosis of our communication capacity we analyzed the international impact of outbreak investigation scientific reports (OIR) made in Spain during 2005–2009 and the specific weight of our local training programme (FETP-PEAC).

METHODS:

We analysed the articles indexed in Pubmed based in OIR made in Spain during 2005–2009. We did the same search for 5 other European countries with local FETPs (UK/Germany/France/Italy/Norway). We compared the Impact Factor (IF) and the number of citations for each publication using Web-of-Knowledge.

RESULTS:

Spain had the highest number of OIR articles (21 versus 20 France, 19 UK, 8 Germany, 5 Italy and 3 Norway). Half of them were published in journals with available IF (52% versus 100% Norway, 75% France, 62% Germany, 42% UK and 40% Italy) but the average IF was among the lowest (2 versus 3.13 UK, 2.65 France, 2.53 Norway, 2.4 Germany and 1.38 Italy). The number-citations/articles-cited ratio of Spanish articles was low as well (3.9 versus 15 Norway, 9.4 Germany, 8.7 UK, 6.9 France and 3 Italy). Globally, FETPs were authors in 8% of all articles (6/76): 2 Spanish, 2 French, 1 UK and 1 German.

CONCLUSIONS:

Although the number of international communications of the Spanish OIR was among the highest, the scientific impact was lower than other European countries' with similar surveillance-system capacities. The participation of FETPs was poor for all analysed countries. In order to improve the national response to outbreaks is essential to strengthen communication capacities among field epidemiologists.

PRESENTED BY: DR MARIANA HAEBERER

Keywords: Outbreaks, epidemiology, communication

ESCAIDE reference number: 20110297

CONTRIBUTION OF MODELLING TO APPLIED EPIDEMIOLOGY

Estimating time-variability in fatality and spontaneous recovery rates for untreated active pulmonary TB

Lorenzo Sabatelli

AFFILIATIONS:
ECDC

BACKGROUND:

Changes in case-fatality and spontaneous recovery rates of pulmonary TB may occur with disease progression and may have important consequences on the effectiveness of control measures, however they are nearly impossible to estimate from current epidemiological data due to compulsory treatment of ascertained cases, which successfully reduces mortality and increases recovery rates.

METHODS:

A model based on recursively applied survival analysis techniques is presented and used to analyze data from an observational study carried out in India in the '60s, in an area where little or no TB control measures were in place.

RESULTS:

Time-dependent rates of mortality and spontaneous recovery for pulmonary active TB are calculated. Active-TB natural-history parameters change significantly depending on the time elapsed since the onset of disease. Case-fatality and spontaneous recovery rates reach their highest values within the first eighteen months of illness.

CONCLUSIONS:

The results suggest heterogeneous TB severity and endogenous frailty (perhaps associated with pre-existing conditions) within the studied population. Time-variations in TB mortality and recovery need to be considered when assessing the real impact of diagnosis and treatment of TB

PRESENTED BY: DR LORENZO SABATELLI

Keywords: Tuberculosis, diagnosis, modeling, natural history, prevalent cohort

ESCAIDE reference number: 20110090

CONTRIBUTION OF MODELLING TO APPLIED EPIDEMIOLOGY

Dynamic simulation of Meningococcal Disease in Portugal after introduction of MenC vaccine

Maria João Simões (1); João Pedro Mendes (2)

AFFILIATIONS:

1. Instituto Nacional de Saúde Dr. Ricardo Jorge
2. Instituto Superior Técnico, Universidade Técnica de Lisboa

BACKGROUND:

Meningococcal disease (MD) is still a public health problem worldwide. Having introduced MenC vaccine, the Portuguese MD surveillance system faces the challenge of assessing the trend of invasive infection due to non-C serogroups, and whether other serogroups might fill the niche left by C-strains.

METHODS:

MD epidemiology is a complex dynamic system with multiple interacting variables. Statistical correlation models usual in epidemiology tend to be misleading to describe complex dynamics with time deferred, indirect, and mutual interactions between variables. System Dynamics seems adequate to model the relationships of mutual causality between variables that are responsible for the historical behavior of MD epidemiology. A model featuring a graphical description of relationships in the form of causal loop and stock-flow diagrams was tuned using Vensim software. This model allows simulations for different scenarios and combinations of parameters. Variables in the model include number of inhabitants, asymptomatic carrier rate, and smoking rate by age group, as well as age of mothers and their smoking rate, immunization rate after invasive disease or carrier period (based on diversity of immunizing outer membrane proteins PorA), occurrence of large events that bring together a large number of individuals in restricted spaces, and bacterial capacity of invasive disease after acquisition.

RESULTS:

A Chi-square test shows a good fit between the model's and historical data (MD cases in Portugal 2002–2010).

CONCLUSIONS:

System Dynamics methodology is suitable for modeling MD epidemiology. Findings showed evidence that the slow decrease in incidence of DM in Portugal results mainly from decreasing of smoking habits and gradual disappearance of clonal strains, presumably due to host immune pressure, not simultaneous with the emergence of new clonal strains, particularly hyper invasive and hyper virulent.

PRESENTED BY: DR MARIA JOÃO SIMOES

Keywords: Meningococcal disease system dynamics

ESCAIDE reference number: 20110092

POSTER SESSION ABSTRACTS

CONTRIBUTION OF MODELLING TO APPLIED EPIDEMIOLOGY

The use of mathematical models to explore the existence of an outbreak of suspected post-cataract surgery endophthalmitis in a London hospital in 2010

Arnaud Le Menach (1, 2) Anjan Ghosh (3), Olivier le Polain (1, 2), Shona Ross (4), Paul Holland (4), Lucy Barker (4), Sarah Furrows (4), Peter Hoffman (5), Paul Crook (1), Barry Walsh (3)

AFFILIATIONS:

1. Health Protection Agency, London and South East Regional Epidemiology Units, 151 Buckingham Palace Road, London, SW1W 9SZ, England, UK
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Control and Prevention (ECDC) Stockholm, Sweden
3. South West London Health Protection Unit, Ground Floor, Building 15, Springfield University Hospital, 61 Glenburnie Road, London, SW17 7DJ
4. Kingston Hospital NHS Trust, Galsworthy Road, Kingston upon Thames, Surrey KT2 7QB
5. Health Protection Agency Center for Infection, 61 Colindale Avenue, London NW9 5HT

BACKGROUND:

Postoperative infectious endophthalmitis (POE) is an uncommon but very serious condition. Differential diagnosis includes Toxic Anterior Segment Syndrome (TASS), an acute aseptic postoperative complication. From May to October 2010, a district general hospital in London reported five suspected POE cases following cataract surgery to the Health Protection Agency (HPA). We conducted an epidemiological investigation to describe the suspected cases and their exposures, and to determine whether the observed incidence was more than expected.

METHODS:

Following the review of hospital records including clinical history, timelines and microbiological results, we classified the five cases as POE, TASS or atypical POE (patients presenting POE-like symptoms but not meeting the case definition of POE or TASS). A multivariate sensitivity analysis based on a Poisson distribution was performed to estimate the probability the hospital was facing an outbreak for a number of cases ranging from 2 to 5 and a baseline incidence rates ranging from 0.5 to 1 case per 1,000 surgeries.

RESULTS:

One case met the POE definition, two were atypical POE and two were classed as TASS. No common risk factors were found. Observing a cluster of five cases would have been significantly more than expected ($p < 0.01$), compared to an expected rate of 1 POE per 1,000. The sensitivity analysis predicted an outbreak in 67.9% of the simulations.

CONCLUSIONS:

Mathematical approaches are useful to explore the probability of outbreak occurrence for rare disease events, particularly when case definition is challenging. They can trigger outbreak alerts when the number of cases reaches an estimated statistical threshold, and thus guide appropriate response.

PRESENTED BY: DR ARNAUD LE MENACH

Keywords: Endophthalmitis; Poisson distribution; Disease outbreaks; Epidemiology; Mathematical Model

ESCAIDE reference number: 20110137

CONTRIBUTION OF MODELLING TO APPLIED EPIDEMIOLOGY

Can changes in patterns of migration result in new HIV outbreaks among heterosexuals in Europe?

Maria Xiridou (1), M. van Veen (1), M. Prins (2, 3), R. Coutinho (1, 4)

AFFILIATIONS:

1. National Institute for Public Health and the Environment (RIVM), The Netherlands
2. Public Health Service of Amsterdam, The Netherlands
3. Academic Medical Center, University of Amsterdam, The Netherlands
4. Utrecht Life Sciences, Utrecht University, The Netherlands

BACKGROUND:

Ethnic minorities originating from countries with high HIV prevalence account for a large number of heterosexually acquired HIV infections in Western European countries. Individuals from these groups may engage in unsafe sexual practices both in the country of residence and in their country of origin. We investigate how patterns of migration may affect the heterosexual HIV epidemic in the Netherlands, a country with low HIV incidence.

METHODS:

A mathematical model was used that describes the transmission of HIV in heterosexual relationships between African migrants, Caribbean migrants, and the local Dutch population. In the model we have also included migration of HIV-infected individuals and infection with HIV during trips to the country of origin.

RESULTS:

The estimated HIV incidence among adult heterosexuals in 2010 was 1.50 new infections per 100,000 individuals per year. If the number of migrants entering the country increases, then the incidence of HIV will increase, although the change among the local Dutch will be negligible. Moreover, if HIV prevalence among those migrating to the Netherlands (at the time of entry to the country) is higher, then the incidence in the respective ethnic groups will increase; among the other ethnic groups, the increase will be very small.

CONCLUSIONS:

Changes in patterns of migration can have a considerable impact on HIV transmission within ethnic minority communities in the Netherlands, but they hardly have any impact on transmission in the local population. Therefore, limiting migration and introducing travel restrictions would likely have no effect on HIV incidence in countries with low HIV prevalence among heterosexuals. Policy making should focus on targeted interventions, to reduce the burden of HIV disease in migrant communities.

PRESENTED BY: DR MARIA XIRIDOU

Keywords: HIV, migrants, mathematical model, heterosexual transmission

ESCAIDE reference number: 20110139

CONTRIBUTION OF MODELLING TO APPLIED EPIDEMIOLOGY

Person-to-person inter-individual contact patterns and the spread of epidemics. Descriptive analysis

Rubén Solano (1), Fernando Morilla (2), Fernando Simón (3), Ferran Martínez (4), Juan de Mata Donado-Campos (3)

AFFILIATIONS:

1. Field Epidemiology Training Program (Spain)
2. National University of Distance Education (UNED)
3. National Epidemiology Center. ISCIII
4. National School Health (ENS)

BACKGROUND:

Disease spread depends of the infection rate which depends on the time and number of contacts a person has in every per time unit and the disease transmission probability. We aim to estimate the mean of the time of contacts using the Spanish Time Use Survey (STUS)

METHODS:

The information about primary and secondary activities was conducted on 46.774 persons of ≥ 10 years old. Stratified analysis by age, sex and location of average per contact was done, We used general estimating equations to estimate the weighted number of households and the number of personized of 10 years old and over.

RESULTS:

It was found that 23.738 (50.8%) of participants answered from Monday to Thursday and 23.036 (49.2%) from Friday to Sunday. The average age was 43.1 and 45.2 years old in men (48.2%) and women (51.8%). The overall mean time of personal activities inside and outside the home, was 11.3 (SE: 2.2) and 11.4 (SE: 2.4) hours in women and men respectively and it increases with the age. Adults living with children, teenagers and students had a high mean time of contact of 15.6 (SE: 11.9) minutes, as well as their household, (from 17.9 minutes (SE: 12.4) to up to one hour). Among the children and the students, females spent a daily average of 3.7 (SE: 3.8) hours to study outside the home and male an average of 3.4 (SE: 3.7) hours.

CONCLUSIONS:

These results create the opportunity to analyze how social interactions and patterns of contacts between people may be useful for estimating and analyzing how infection can spread in places like work, school and how this is interconnected with household contacts.

PRESENTED BY: MR RUBÉN SOLANO

Keywords: PERSON-TO-PERSON

ESCAIDE reference number: 20110160

CONTRIBUTION OF MODELLING TO APPLIED EPIDEMIOLOGY

Using auto-regressive integrated moving average (ARIMA) time series analysis to model frequent causes of bloodstream infection

David Jenkins

AFFILIATIONS:

Department of Clinical Microbiology, University Hospitals of Leicester NHS Trust, Leicester, England

BACKGROUND:

A mathematical description of the temporal pattern of an infectious disease allows greater understanding of its epidemiology, permits measurement of the impact of control interventions, aids comparison between different settings and facilitates prediction of future infection rates. ARIMA modeling, frequently used to describe economic time series, can be applied to infectious disease time series, as demonstrated here.

METHODS:

Quarterly numbers of frequent causes of bacterial bloodstream infection (*Escherichia coli*, meticillin sensitive and resistant *Staph aureus* (MSSA, MRSA), *Klebsiella pneumoniae*, *Streptococcus pneumoniae*, *Pseudomonas aeruginosa*) detected by a microbiology laboratory serving a 1800-bed hospital and surrounding community of one million population (Leicestershire, England) between 1999 and 2010, were analysed by ARIMA modeling, including estimations of intervention effects, using R (2.11.1, TSA package).

RESULTS:

E coli bacteraemias increased abruptly (31 extra cases per quarter) from the second quarter of 2006 for an unidentified reason, MRSA infections fell by 12 cases per quarter following the introduction of an intervention in the second quarter of 2007, *K pneumoniae* bloodstream infections rose steadily throughout the decade, seasonal variation of *S pneumoniae* and *P aeruginosa* infections was apparent. Using ARIMA nomenclature: *E coli* (0,1,1) MA coefficient (se)= -0.78 (0.10), intervention covariate coefficient (se)= 31.35 (6.21) MSSA (0,1,1) MA coefficient (se)= -0.72 (0.10) MRSA (0,1,1) MA coefficient (se)= -0.64 (0.11), intervention covariate coefficient (se)= -12.57 (4.29) *K pneumoniae* (0,1,1) MA coefficient (se)= -0.81 (0.07) *S pneumoniae* (0,0,0),(0,1,2) seasonal difference, period 4, seasonal MA coefficients (se)= -0.88 (0.13), 0.56 (0.21) *P aeruginosa* (0,0,0),(0,1,1) seasonal difference, period 4, seasonal MA coefficient (se)= -0.92 (0.29)

CONCLUSIONS:

Temporal changes in infectious diseases can be readily described and quantified by ARIMA modeling

PRESENTED BY: DR DAVID JENKINS

Keywords: Bacteremia epidemiology ARIMA modelling

ESCAIDE reference number: 20110206

POSTER SESSION ABSTRACTS

CONTRIBUTION OF MODELLING TO APPLIED EPIDEMIOLOGY

Transmission and control in an institutional outbreak of pandemic influenza A (H1N1) 2009

*N. Arinaminpathy (1), *N. Raphaely (2), L. Saldana (2), C. Hodgekiss (2), J. Dandridge (3), K. Knox (4), N. D. McCarthy (1, 2)
* These authors contributed equally to the work.

AFFILIATIONS:

1. Department of Zoology, University of Oxford, Oxford, UK
2. Health Protection Agency, UK
3. NHS Oxfordshire, Oxford, UK
4. Summertown Medical Centre, Oxford, UK

BACKGROUND:

A pandemic (H1N1) 2009 influenza outbreak in a summer school affected 117 of 276 (42%) students with new students each week providing susceptible cohorts. The outbreak was controlled using routine infection control measures and prompt treatment of cases. Modelling was used retrospectively to evaluate the impact of these interventions.

METHODS:

Independence of identified risks was assessed using likelihood ratio tests from multivariate logistic regression models. Two separate modelling approaches were used to estimate the effect of interventions on transmission. The Wallinga-Teunis method estimated R_{eff} from the incidence data, then incidence data was used to fit simple deterministic models of transmission dynamics, and to estimate basic transmission parameters (constituents of R_0) before and after interventions.

RESULTS:

Residential social contact, but not classroom setting, was associated with risk of infection. The initial estimated R_{eff} by the Wallinga-Teunis method was 5 (95% CI 2.8-7.2) and dropped daily until it was <1 on day 6. With sensitivity analyses, the estimates of R_{eff} remained substantially greater than 1 initially and dropped rapidly between day 4-6. Overall, parameter estimates suggest consistently that interventions may have succeeded in bringing the basic reproductive number R_0 just below 1. Modelling suggested that case isolation and increased hygiene measures had concomitant, substantial effects on overall transmission. Cancelling social activities may have 'stabilised' contact rates, essentially avoiding the transient increases in contact associated with social gatherings.

CONCLUSIONS:

Modelling-based estimates of transmission in this outbreak suggest that basic interventions may have been effective in controlling the outbreak in this high-risk setting and demonstrate the potential for application of modelling in evaluating interventions during outbreaks.

PRESENTED BY: DR NIKA RAPHAELY

Keywords: Outbreak; modelling; influenza; H1N1; epidemiology; institution

ESCAIDE reference number: 20110299

CONTRIBUTION OF MODELLING TO APPLIED EPIDEMIOLOGY

Controlling varicella and zoster: the challenge of rational opposition to the varicella vaccine

Piero Manfredi (1), P. Poletti (2), A. d'Onofrio (3), S. Merler (2)

AFFILIATIONS:

1. Dipartimento di Statistica e Matematica Applicata all'Economia, University of Pisa, Pisa, Italy.
2. Predictive models for Biomedicine and Environment, Fondazione Bruno Kessler, Trento, Italy.
3. Theoretical Biology and Medicine Unit, European Institute of Oncology, Milan, Italy.

BACKGROUND:

The introduction of the varicella vaccine in Europe is widely debated, due to the unknown impact of the vaccination on the epidemiology of zoster, and the complexity of the vaccination schedules in order to cope with limited vaccine efficacy and waning immunity. A further subtle obstacle is represented by the fact that varicella is currently perceived as a "minor infection", with a very low perceived risk of serious disease.

METHODS:

We rely on a Realistic Age Structured model for the investigation of the dynamics and control of varicella and zoster, including dynamic vaccination choices, to investigate the potentially perverse impact of rational opposition to the varicella vaccine. The vaccine uptake is modelled by using a game-theoretical approach, with a dynamical behavioural response to different risks from infection and the vaccine. The transmission model is parametrized by recently collected European data on contact patterns, varicella serological data, and zoster incidence data. We parametrize vaccination choices using Italian survey data on perceived risks of varicella disease and vaccine.

RESULTS:

In a non-mandatory vaccination regime the impact of varicella and zoster immunization programmes can be seriously undermined by rational opposition to the varicella vaccine. The combined effect of a low perceived risk of serious disease and a positive perceived risk of vaccine side effects from varicella vaccine, can induce a decline in vaccine coverage even when a high initial uptake is assumed, thereby compromising the success of the programme, and generate, under some scenarios, a variety of perverse effects.

CONCLUSIONS:

Rational opposition to vaccination programmes should be accounted for while considering the introduction of mass immunization programmes against varicella and zoster.

PRESENTED BY: PROF PIERO MANFREDI

Keywords: Varicella-zoster virus, mathematical modelling, human behaviour, vaccination.

ESCAIDE reference number: 20110349

FOOD- AND WATER-BORNE DISEASES

The year culminated in a disastrous Christmas meal: Investigating an increase in listeriosis, Finland 2010

Ruska Rimhanen-Finne (1), U. Nakari (1), L. Rantala (2), T. Johansson (2), A. Pihlajasaari (2), A. Siitonen (1), M. Kuusi (1).

AFFILIATIONS:

1. National Institute for Health and Welfare, Helsinki, Finland
2. Finnish Food Safety Authority Evira, Helsinki, Finland

BACKGROUND:

In recent years the annual number of listeriosis cases has increased in several European countries. In 2010, a significant rise over the previous years was seen in Finland. Since 2006, a specific type of *Listeria monocytogenes* (PFGE96) has increased in both humans and fishery products.

METHODS:

Culture-confirmed listeriosis cases are notified to, and isolated strains sero- and genotyped at the National Institute for Health and Welfare (THL). Case definition follows the one of the European Commission. The cases were interviewed by phone regarding their exposure to ready-to-eat fishery products. Environmental investigations were conducted by the Finnish Food Safety Authority Evira.

RESULTS:

In 2010, 71 listeriosis cases were reported (1.3/100,000), their median age was 74 years. Males and females were equally reported. Most infections (81%) were septic, seventeen cases (24%) died. Five (7%) were materno-fetal cases. Consumption of gravad or cold-smoked salmon was reported by 60% of interviewed cases. Serotype 1/2a (72%) and genotype PFGE96 (19%) predominated. In food, PFGE96 was the most frequent genotype found. Majority of PFGE96 isolates originated from one fishery production plant. The plant conducted major sanitation and improved production processes. A cluster of 4 elderly cases (PFGE62) from different parts of Finland was identified. Identical genotype was found in a specific salmon product that all cases had been served during Christmas. Minor control measures were performed at the production plant.

CONCLUSIONS:

Identical listeria types were found in humans and fishery products. Control of production plants should be improved, thus local authorities were requested to intensify the control in production plants and food premises. THL and Evira communicated to the public that immunocompromised persons should avoid fishery products containing listeria risk.

PRESENTED BY: DR RUSKA RIMHANEN-FINNE

Keywords: Listeriosis, fishery products

ESCAIDE reference number: 20110022

FOOD- AND WATER-BORNE DISEASES

Disease burden of (foodborne) norovirus illness in the Netherlands in 2009

Linda Verhoef (1), M. Koopmans (1, 2), W. van Pelt (1), E. Duizer (1), J. Haagsma (3), D. Werber (4), A. Havelaar (1,5)

AFFILIATIONS:

1. National Institute for Public Health and the Environment, Bilthoven, the Netherlands
2. Virology Department, Erasmus Medical Centre, Rotterdam, The Netherlands
3. Department of Public Health, Erasmus Medical Centre, Rotterdam, the Netherlands
4. Robert Koch Institute, Berlin, Germany
5. Institute for Risk Assessment Sciences, Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands

BACKGROUND:

Although noroviruses are responsible for a large number of infections worldwide each year, several studies illustrated the uncertainty in the burden estimates of norovirus illness. Over the last decade new insights were gained into the potential severity of norovirus infections, and increased norovirus activity. Our objective is to provide an updated estimate of the disease burden of (foodborne) norovirus illness in the Netherlands in 2009.

METHODS:

For both community-acquired cases and institutional outbreaks, the norovirus disease outcomes – illness, visiting a general practitioner, hospitalization and mortality – were derived from cohort studies, surveillance data and literature. Age-specific incidence estimates were applied to the population age distribution in the Netherlands in 2009. The different outcomes were combined in one single metric, the Disability Adjusted Life Year (DALY). A stochastic Monte Carlo simulation model was built to quantify uncertainty. The foodborne proportion was derived from previously published studies, being 17% for community-acquired and 20% for outbreak cases.

RESULTS:

The overall incidence of norovirus gastroenteritis disease in 2009 was estimated to be 630,000 (95%CI 437,000-895,000) cases, the number of fatal cases 90, resulting in 1,688 (95%CI 1,027-2,740) DALYs. This is over 3-fold the previous estimates in 1999 and 2004, being 450 DALYs. A total of 107,200 norovirus cases and 16 deaths can yearly be attributed to food, resulting in 290 DALYs.

CONCLUSIONS:

On the basis of newly gained insights in the case-fatality ratios of the disease, the burden of norovirus in general is now estimated to be over 3-fold the previously assumed 450 DALYs. In addition, we provide a first DALY estimate of the burden of foodborne norovirus disease in the Netherlands.

PRESENTED BY: DR LINDA VERHOEF

Keywords: Norovirus, burden of illness, quality adjusted life years, foodborne, Netherlands, stochastic processes

ESCAIDE reference number: 20110023

POSTER SESSION ABSTRACTS

FOOD- AND WATER-BORNE DISEASES

Acute Flaccid Paralysis: epidemiologic surveillance in Emilia Romagna Region (Italy) 1996–2010

Paola AFFANNI (1) – Maria Eugenia COLUCCI (1) – Tijana LALIC (1) – Anna ODONE (1) – Francesca PAGANUZZI (1) – Matteo RICCO' (1) (2) – Licia VERONESI (1) – Maria Luisa TANZI (1)

AFFILIATIONS:

University of Parma, Department of Public Health – Via Volturmo 39, 43123 Parma (2) CdC San Clemente, Viale Pompilio 65, 46100 Mantova

BACKGROUND:

Acute Flaccid Paralysis (AFP) is a clinical syndrome encompassing all cases of paralytic poliomyelitis: therefore, epidemiologic surveillance for AFP cases is of public relevance as an instrument for detecting potential cases and poliovirus infections. Since 1996, the Department of Public Health of Parma University was recognized as regional reference center for Emilia Romagna Region (ERR) for AFP surveillance. Here we present a 15-year summary of the surveillance activity.

METHODS:

All AFP cases for 1996–2010 with age at notification ≤ 15 years were retrospectively analyzed, retrieving personal and clinical data from the epidemiological notification forms. These records were then revised and compared by the laboratory records. Incidence Rates were then calculated from the Italian National Institute for Statistics (ISTAT) data about ERR population.

RESULTS:

Overall, 39 AFP were notified (24 males, 15 females; mean age: 6.5 y and 7.7 y respectively) for a mean of 2.6 cases (95%CI:1.82–3.38) on year basis, with a notification rate of 0.51 cases/100,000 subjects/year (95%CI:0.34–0.68). Fever $\geq 38^\circ\text{C}$ was the initial symptom in 48.7%, and the clinical syndrome was associated with a progressive pattern in 51.3%, with symmetrical paralysis in 59% of cases. Only 5 subjects (12.8%) were affected by a paralysis lasting more than 60 days

CONCLUSIONS:

In general, AFP notification rate in ERR was lower than the expected value on national data basis (0.64 cases/100,000 subjects/year 95%CI 0.49 – 0.78). In general, our results suggest that the continuation of surveillance will need a further and detailed sensitization of health-care workers.

PRESENTED BY: DR MATTEO RICCO'

Keywords: Poliovirus – Acute Flaccid Paralysis – Enterovirus

ESCAIDE reference number: 20110062

FOOD- AND WATER-BORNE DISEASES

Large outbreak of Shigellosis associated with contaminated water supply in rural villages, Chiangmai province, Thailand, October 2010

Jamorn Makaroon (1), C. Jiraphongsa (1), N. Henprasertthae (1), H. Praekunatham (1), T. Sirisomboon (2), J. Aphichai (2), N. Chalearnsuk (3), R. Aomaree (3), S. Gongnyeang (3), R. Aomaree (3)

AFFILIATIONS:

1. Field Epidemiology Training Program, Bureau of Epidemiology Department of Disease Control, Ministry of Public Health, Thailand
2. Surveillance and Rapid Response Team (SRRT), Chomtong District Health Office, Chiangmai Health Office
3. SRRT, Chomtong hospital, Chiangmai Hospital

BACKGROUND:

On 15/10/2010, we were notified that a district hospital had 120 diarrhoea cases and 4 cases reported as shigellosis within 1 week. We collaborated with local SRRT to identify source and risk factors of outbreak.

METHODS:

We reviewed medical records and conducted cross sectional study in the village to identify risk factors by multivariate logistic regression. Suspect cases were person who had ≥ 1 gastrointestinal symptoms. Probable cases were suspect cases who had mucous-bloody diarrhea or found WBC > 20 cells/HF in stool. Cases were confirmed by stool culture. We surveyed water supply system and examined water samples.

RESULTS:

Overall, 192 cases were identified from 3 villages, 159 suspect, 27 probable and 6 confirmed cases. Median age was 40 years old (IQR=23-55). There were 19 hospitalized cases, no death. Clinical manifestations included fever (63%), abdominal pain (55%), mucous-bloody diarrhea (15%) and shock (5%). These 3 villages were located along Mae-ya river. Early cases lived upstream. Most of cases lived in Village12 which was downstream (attack rate=28%). In Village12, 53% of households had case(s). Water supply in Village12 came from Mae-ya river which partly ran to houses directly, and partly passing through water filters. None of these water sources were chlorinated. We found *Escherichia coli* and Coliform Bacteria in water from wells and water filters much higher than standard. Risk factors were drinking water from well (adjusted OR=1.61, 95%CI=1.04-2.48), water filter (adjusted OR=1.96, 95%CI=1.28-3.00) and consuming river water (adjusted OR=1.76, 95%CI=1.11-2.78).

CONCLUSIONS:

Water supply in Village12 was heavily contaminated. Villagers who drank water from well, water filter or consumed river water were at high risk. We organized a meeting among health and local authorities to discuss improvement of water supply system.

PRESENTED BY: DR JAMORN MAKAROON

Keywords: Shigella, water supply, Coliform Bacteria, *Escherichia coli*

ESCAIDE reference number: 20110079

FOOD- AND WATER-BORNE DISEASES

What caused the Campylobacter outbreak-people, parfait or poultry?

Margaret Lewin, Jaan Stanton, Jenny Harries, Caroline Barker, Chris Williams, Mark Reacher, Pat Nair

AFFILIATIONS:

The Health Protection Agency, Norwich city council, NHS Norfolk, Norfolk and Norwich University Hospitals

BACKGROUND:

Environmental Health were contacted by a local restaurant following a complaint that a customer contracted Campylobacter infection after eating lunch there. Other members of their party had also been unwell.

METHODS:

The exposed population was defined as 42 people eating lunch at the restaurant on the same day as the confirmed case (contact details available for 34/42). Information obtained via questionnaire was analysed in STATA. Stool samples were requested from those reporting illness. A different batch of chicken liver parfait (CLP), chicken livers from same source and chicken faecal samples from the home of index case were also cultured.

RESULTS:

Response rate for the questionnaire was 61.7% (21/34). Attack rate was 19% (4/21). The only significant food exposure in univariable analysis was the CLP (RR=4.9 with adjustment, $p=0.09$; $p=0.02$ without adjustment, $RR \infty$). 2 of 5 faecal samples tested positive for Campylobacter, both from the same family. CLP was negative, raw chicken livers and chicken faecal samples were positive. Both human and chicken faeces had identical isolates (C.jejuni serotype 11 phagetype 2). Campylobacter serotype 10 was found in the raw chicken livers

CONCLUSIONS:

This small outbreak is linked to a restaurant meal and household ownership of chickens. The questionnaire showed CLP as a significant exposure. Microbiologically the typed human case was linked to household chickens rather than chicken livers. Either the source was the household chickens, the meal being coincidentally related, or CLP was the source and typing results were coincidental or represented secondary spread to rather than from the chickens.

PRESENTED BY: DR GIRI SHANKAR

Keywords: Campylobacter, Epidemiology

ESCAIDE reference number: 20110094

FOOD- AND WATER-BORNE DISEASES

Persistent gastrointestinal symptoms among immunocompetent individuals following a foodborne microsporidiosis outbreak in Sweden, 2009

Valérie Decraene (1, 2), M. Löfdahl (3)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Department of Analysis and Prevention, Swedish Institute for Communicable Disease Control, Solna, Sweden
3. Department of Preparedness, Swedish Institute for Communicable Disease Control, Solna, Sweden

BACKGROUND:

Microsporidia infrequently cause disease among immunocompetent individuals. We previously reported the first foodborne outbreak of intestinal microsporidiosis (*Enterocytozoon bieneusi*) affecting 135 people attending a conference in Sweden. Three months after the investigation, people were still reporting gastrointestinal symptoms. We performed a follow-up study to better describe the spectrum and duration of symptoms and determine the effect of underlying medical conditions on disease outcome.

METHODS:

Six months after the initial investigation, we conducted another retrospective cohort study among conference attendees (N=471) using a web-based questionnaire regarding symptoms, underlying medical conditions and medications. Cases were individuals who developed diarrhoea, abdominal pain, nausea or bloating within 28 days of the event on 23.10.2009. Descriptive analysis of symptoms was performed and relative risks (RR) with 95% confidence intervals (CI) were calculated for each exposure.

RESULTS:

The response rate was 60% (281/471); 89 cases were identified. The median incubation time was 10 days (1–21 days). The main symptoms were abdominal pain (87%), bloating (85%), diarrhoea (82%) and nausea (78%). Diarrhoea lasted less than one week for the majority (75%) of cases. Seven months after the event, 33 (37%) cases still had symptoms, predominantly intermittent bouts of diarrhoea and bloating. Three cases reported developing lactose-intolerance. Individuals reporting gastrointestinal disorders (gastric ulcer or chronic bowel diseases) were twice as likely to become ill as those without (RR=2.0, 95% CI 1.3-3.3).

CONCLUSIONS:

To our knowledge, this is the first study to describe the clinical spectrum of Microsporidia infection among a large immunocompetent population: disease is characterised by self-limiting diarrhoea lasting less than one week, with abdominal pain, nausea and bloating which can recur for months. Having an underlying gastrointestinal disorder increases the risk of developing microsporidiosis.

PRESENTED BY: DR VALERIE DE CRAENE

Keywords: Microsporidia, outbreak, emerging, symptoms, incubation period

ESCAIDE reference number: 20110112

POSTER SESSION ABSTRACTS

FOOD- AND WATER-BORNE DISEASES

An investigation of the largest typhoid outbreak in Thailand, October 2009–April 2010

Narong Henprasertthae (1), P. Doung-ngern (1), S. Preechapanich (3), C. Nichakrum (4), C. Phaetphong (5), L. Sukum (2), N. Chuaydumrong (2), B. Sukseesaen (5), P. Samitsuwan (1), A. Kanjanapiboolwong (1), S. Al-ishak (1), P. Silaporn (1), A. Watthanasak (1)

AFFILIATIONS:

1. Field Epidemiology Training Program (FETP), Bureau of Epidemiology, Department of Disease Control, Nonthaburi, Thailand
2. Office of prevention and control, 12th division
3. Songkhla provincial health office
4. Muang Songkhla district health office
5. Songkhla hospital 6Thailand-United State Co-operation

BACKGROUND:

In December 2009, two large clusters of typhoid from schools in Songkhla Province were reported. An investigation was initiated to identify source and risk factors.

METHODS:

Descriptive study was done by reviewing hospital database and laboratory logbook, and active case finding. We used adapted Bureau of Epidemiology's typhoid case definition. We surveyed environment of schools, a reformatory, water supply department, and markets. We collected blood samples from suspected cases for hemoculture, Widal or IgM test and collected stool sample from food handlers for culture. A matched case-control study was conducted.

RESULTS:

We identified 514 typhoid cases including 181 confirmed. 55% of the cases were male and median age was 9 years (IQR 7,17). Three clusters were detected from school W, A and the reformatory (AR=4.1%, 4.9%, and 17.3%, respectively). The schools and reformatory had poor sanitation. Tap water had residual chlorine less than 0.2 ppm. 16/88 (18%) of food handlers from all clusters had positive results for salmonella non-typhi. The review of molecular study showed that organism from different clusters were more likely to come from a same source. Being a student or living in the reformatory and having food from temporary market were potential risk factors, adjusted-OR=11.70 (95%CI=1.93–70.81) and 3.65 (95%CI=1.09–12.2), respectively. Frequently washing hand with soap before having food was a protective factor, adjusted-OR=0.06 (95%CI=0.01–0.42).

CONCLUSIONS:

This was the biggest typhoid outbreak reported in Thailand. Being a student as well as having food from mobile vender was the suspected risk factors. Control measures have been implemented including strengthening surveillance, screening food handlers, improving sanitation and water supply quality, and providing health education in school and the reformatory.

PRESENTED BY: DR NARONG HENPRASERTTHAE

Keywords: Typhoid outbreak, *Salmonella typhi*, Songkhla province, Thailand

ESCAIDE reference number: 20110115

FOOD- AND WATER-BORNE DISEASES

Campylobacter outbreak in a school in Barcelona

Eugenio Calciati (1), S. Lafuente (1), M. De Simó (1), P. Balfagón (1), R. Bartolomé (2), M. Santz (1), J. Caylà (1).

AFFILIATIONS:

1. Epidemiology Department, Public Health Agency of Barcelona
2. Hospital Vall d'Hebrón, Barcelona, Spain

BACKGROUND:

Campylobacteriosis is the most frequently reported zoonotic disease in humans in the European Union (EU). On 27th September 2010 the Public Health Agency of Barcelona (PHAB) was alerted of an unusual rate of 68 absences among 435 scholars.

METHODS:

A case was defined as a schoolchild presenting diarrhea, abdominal pain, fever or vomiting. We conducted a retrospective cohort study among all schoolchildren exposed to canteen food and interviewed all children's parents

RESULTS:

Schoolchildren affected were 75 of 435 potentially exposed (17.2%). 90% of affected children presented diarrhea, 90% abdominal pain, 77% fever (median: 38^o5), 31% vomiting and 27% nausea. 24 children consulted their pediatrician, and 2 were hospitalized. Median age of cases was 6 years and 52% of them were boys. After the onset of 1 case, the number of cases rose sharply to reach a peak of 30 new cases on the second day and decreased then rapidly to zero in 3 days. Illness median duration was of 3 days. The highest risk ratio associated to food resulted for the 21st September (RR=9.4, 95% CI: 1.3-66.1) when roast chicken and Russian salad were served. Food control authorities found deficiencies in the school kitchen facilities and in the food handling process.

CONCLUSIONS:

Campylobacter, despite being one of the leading causes of bacterial infections, does not usually generate outbreaks. This outbreak is uncommon due to its size: 75 infected children. In school kitchen cross-contamination may have occurred because of the small surface of manipulation for both raw and cooked food, through the contamination of kitchen gadgets or the hands of food handlers. Another possible mechanism might have been the leakage of the raw chicken juice onto a ready-to-eat food.

PRESENTED BY: MR SARAH LAFUENTE VAN DER SLUIS

Keywords: Campylobacter, outbreak, cross-contamination,

ESCAIDE reference number: 20110121

FOOD- AND WATER-BORNE DISEASES

Waterborne outbreak of Hepatitis A in adults in a Thai-Cambodian border district, Thailand, October 2010–February 2011

T. Wangteeraprasert (1), R. Buathong (1), A. Yodkhow (1), S. Aimwilai (2), M. Paritpab (2), S. Pirompak (3), S. Temsiriphum (4), J. Reuankhong (4), S. Iamsirithaworn (1)

AFFILIATIONS:

1. FETP, Bureau of Epidemiology, Department of Disease Control, Ministry of Public Health, Thailand
2. Khlong Yai Hospital, Trat, Thailand
3. Trat Provincial Health Office, Trat, Thailand
4. Office of Disease Prevention and Control 3, Department of Disease Control, Ministry of Public Health, Thailand

BACKGROUND:

On 28th December 2010, Hepatitis A outbreak in Khlong Yai, Thai-Cambodian District was notified. The investigation objectives were to determine the extent of the outbreak, identify source of infection and risk factors, and to implement control measures.

METHODS:

A suspected case was defined as a person who developed jaundice or a patient diagnosed hepatitis A or unspecified hepatitis in Khlong Yai Hospital between 26th September 2010 and 17th February 2011. We conducted a matched case-control study (1:4 ratios). Only confirmed cases with serum positive IgM by ELFA technique were included in conditional logistic regression analyses. Foods and drinks in the district were sampled for Hepatitis A RNA testing by PCR technique. Water production process in suspect factory was inspected.

RESULTS:

Eighteen cases of hepatitis A (including 13 confirmed cases) were identified in 4 clusters. Median of age was 31 years (Range: 11–62) with highest attack rate in 26–35 years (168.1 per 100,000 population). Of all cases, 72% drank drinking water produced by local factories including Factory A where water sample was tested positive for Hepatitis A virus. Consumption of water product from Factory A was a significant risk factor with Adj. OR=5.69 (95% CI=1.01, 32.03). Thais aged below 35 years were non-immune in greater percentage than those 35 years and older (24.5% vs. 87.5%, p -value < 0.001) but not different among Cambodians. During factory inspection, we observed insanitary packaging water barrel with bare hands and stagnant water on the floor.

CONCLUSIONS:

A laboratory-confirmed hepatitis A outbreak in Khlong Yai District mainly affected adult population (83.3%). The common source outbreak was attributable to contaminated water product from Factory A. Hepatitis A vaccination is recommended for young Thai adults in the affected area.

PRESENTED BY: DR TANAPOL WANGTEERAPRASERT

Keywords: Hepatitis A, outbreak, waterborne, immunity, Thailand

ESCAIDE reference number: 20110175

FOOD- AND WATER-BORNE DISEASES

Campylobacteriosis Outbreaks and Raw Milk Consumption, Hesse, Germany, 2005–2010

Sarah McFarland (1), D. Günter (2), G. Engeler (3), A. Schweigmann (4), M. Just (5), K. Semek (6), K. Schlez (7), A. M. Hauri (1)

AFFILIATIONS:

1. Hesse State Health Office, Dillenburg, Germany
2. Groß-Gerau Public Health Office, Groß-Gerau, Germany
3. Darmstadt-Dieburg Public Health Office, Darmstadt, Germany
4. Darmstadt-Dieburg Veterinary Health Office, Darmstadt, Germany
5. Marburg-Biedenkopf Public Health Office, Marburg, Germany
6. Odenwald Public Health Office, Erbach, Germany
7. Veterinary State Office, Gießen, Germany

BACKGROUND:

Campylobacter infection is the most common cause of bacterial gastroenteritis worldwide. In Hesse, Germany, Campylobacteriosis has been a notifiable disease since 2001 with annual numbers of reported cases ranging from 3,200 in 2003 (53 per 100,000 population) to 4,907 in 2010 (81 per 100,000 population). 95% of cases are sporadic, i.e. not associated with identified clusters. Consumption of raw milk is a known risk factor for Campylobacteriosis. In Germany, existing regulations allow the sale of raw milk from certified producers, provided regulations regarding labeling and storage are met, e.g. consumers are informed about the need for boiling before consumption.

METHODS:

We analysed the Hessian database for notifiable diseases for Campylobacter outbreaks including ≥ 5 cases reported from 2005–2010. For outbreaks with information suggesting a milk (product) involvement, additional information on the outbreaks and investigations carried out were obtained from local public and veterinary health authorities.

RESULTS:

From 2005–2010, 15 Campylobacter outbreaks including 220 cases (range: 5–77 cases; median: 8) were reported. Of these fifteen outbreaks, four were associated with raw milk consumption and involved 6, 6, 8 and 77 cases. Three of the four outbreaks occurred in groups that visited dairy farms and one in a group of children attending a church service. Two outbreaks occurred in separate groups that visited the same farm three weeks apart. Members of all groups were offered unboiled milk (4 outbreaks) or milk shakes (3 outbreaks) prepared with unboiled milk. Milk samples taken from two farms were culture negative for Campylobacter.

CONCLUSIONS:

These outbreaks in Hesse highlighted that regulations for the sale and distribution of raw milk were insufficiently followed and that raw milk consumption remained a risk factor for Campylobacter outbreaks.

PRESENTED BY: MISS SARAH MCFARLAND

Keywords: Campylobacter, Raw Milk, Food-borne illness, Outbreak

ESCAIDE reference number: 20110275

POSTER SESSION ABSTRACTS

FOOD- AND WATER-BORNE DISEASES

Hospital based case-control study on risk factors for systemic *Salmonella enterica* spp. infections in Ghana

Krumkamp R (1), Schwarz NG (1)*, Sarpong N (2), Acquah SEK (2), Agyekum A (2), Nkrumah B (2), Loag W (1), Dekker D (2), Adu-Sarkodie Y (2), May J (1)

AFFILIATIONS:

1. Bernhard Nocht Institute for Tropical Medicine, Hamburg, Germany
 2. Kumasi Centre for Collaborative Research in Tropical Medicine, Kumasi, Ghana
- * Presenting author

BACKGROUND:

Salmonella enterica (non-Typhoid-*Salmonella*, NTS) are an important cause of septic infection in children and adolescents. Due to the widespread occurrence of NTS, sources of infection vary from contaminated food items, water, person-to-person, to animal-to-person transmission. We performed a case control study to identify exposures with an association to NTS sepsis.

METHODS:

Blood cultures were done from patients admitted to a hospital in Ghana between 18.01.2010–27.02.2011. Cases were attendees having an NTS positive blood culture. Controls had no history of fever or diagnosis of enteric fever. Controls were frequency matched for age with a case/control-ratio of 1/4, using age groups (0–1, 1–2, 2–5 years, then 5-year steps). Socio economic data and health relevant behaviour was assessed at hospital admission. Odds ratios (OR) and corresponding 95%-confidence limits (CL) were calculated using logistic regression.

RESULTS:

Thirty-two *Salmonella* cases were identified during the study period. Mean age was 10.0 years (SD 17.4, range 0–70). 128 controls were age-matched to the cases. The strongest association was found for drinking water from a well vs. other source (OR 6.0, CL 0.9; 42.3) and for residence in urban settings (OR 0.3, CL 0.1; 0.8). The association got significant in the regression model (water from well: 10.1, CL 1.9; 52.6, urban residence: OR 0.3, CL 0.1; 0.7). However only 4 of the 32 cases reported the exposure to drinking water.

CONCLUSIONS:

The association between well water and NTS-sepsis indicates that supplying individuals who drink from wells with safe water may decrease the risk of NTS-sepsis for these individuals. However, the study also highlight that more NTS sources are present as only 1/8 of all cases were exposed to well water.

PRESENTED BY: DR NORBERT SCHWARZ

Keywords: *Salmonella*, case control study, risk factors

ESCAIDE reference number: 20110306

FOOD- AND WATER-BORNE DISEASES

A survey on criteria used by Italian general practitioners in prescribing laboratory investigation for acute gastrointestinal illness

Francesca Baldinelli (1), L. Mughini Gras (1), E. Ubaldi (2), G. Scavia (1)

AFFILIATIONS:

1. Istituto Superiore di Sanità, Rome, Italy.
2. Società Italiana di Medicina Generale, Firenze, Italy

BACKGROUND:

Criteria used by general practitioners (GP) in prescribing laboratory investigations for food-borne pathogens associated with acute gastrointestinal illness (AGI) vary considerably, depending on the patient characteristics, illness severity and GP personal experience. The knowledge on how these criteria are applied is helpful for estimating the underreporting that affects data from passive surveillance with the aim to better evaluate the global burden of AGI.

METHODS:

Information on these criteria was collected from attendees of the National Conference of the Italian Society of General Medicine, in 2010, using a self-administered questionnaire. The sample was obtained by convenience, as only 130 out of 1500 GP attending the conference, filled out the questionnaire.

RESULTS:

Results show that GP recommended testing samples in 9.2% of patients (>14 years-old) with AGI symptoms. For this purpose, only the 5.4% of GP followed standardized guidelines. The prescription for faecal examination was more frequently required in case of bloody diarrhoea, duration of illness >7 days, or if immunodeficiency or recent travel was reported by the patient. The indication of specific etiologic agents to be investigated was specified by the 21% of GP. *Salmonella* spp., *Escherichia coli* O157 and *Shigella* spp. were the most frequently investigated pathogens. Testing for parasites was mainly requested on the basis of clinical suspect, while viruses, particularly Norovirus, were rarely recommended.

CONCLUSIONS:

Although our results might be considered little representative, they provide a preliminary overview on behaviours affecting the prescription of laboratory investigations in AGI cases, which could be modified in order to reduce underreporting of AGI in the surveillance system. Moreover results from this pilot study will contribute to identify area for further and more tailored investigation on a larger scale.

PRESENTED BY: DR FRANCESCA BALDINELLI

Keywords: Acute gastrointestinal illness, general practitioner, laboratory investigation

ESCAIDE reference number: 20110326

HEALTH CARE ASSOCIATED INFECTIONS

Cluster of post-operative intracranial infections due to *Propionibacterium acnes*

Nic Coetzee (1), K. Banavathi (2), N. Inglis (1), G. Odaghara (1), J. Singh (2), S. Suleman (1), O. Edeghere (1)

AFFILIATIONS:

1. Health Protection Agency, West Midlands, UK
2. University Hospital of North Staffordshire NHS Trust, Stoke-on-Trent, England

BACKGROUND:

Propionibacterium acnes, an anaerobic gram-positive bacterium is largely considered a skin commensal commonly linked to acne vulgaris. Sporadic cases of post-operative infections following neurosurgical procedures have been reported but we did not find any reports of clusters or outbreaks in the literature. We present findings from the investigation and subsequent control of an unusual nosocomial cluster in a tertiary healthcare setting in the Midlands, UK.

METHODS:

A case-control study, microbiological and environmental investigations were undertaken. Nine cases of post-craniotomy intracranial infection due to *Propionibacterium acnes* were identified between May and October 2010. 36 controls had craniotomy during the same time period as cases but did not develop *P. acnes* infection in the post-operative period.

RESULTS:

Cases had undergone craniotomy for tumours on average 40 days prior to infection diagnosis (SD: 19.4). The majority (78%; 7/9) of the operations were classed as urgent and the remainder were elective. The mean age of cases was 57 years (SD: 14) and the majority (67%; 6/9) were female. Univariate analysis showed that post-craniotomy *P. acnes* infection was associated with a history of diabetes (OR= 21.2; P-value = 0.002) and having an urgent operation (OR = 5.8; P-value = 0.04). Environmental investigation confirmed theatre air flow/ventilation to be adequate, with all air and surface swabs yielding negative cultures. Infection control practices and surgical procedures were audited but did not identify any root causes of these infections. Control measures included restrictions to staff movement and staff complement in theatres; screening and exclusion of staff with skin conditions, and environmental cleaning.

CONCLUSIONS:

The timely investigation and implementation of control measures prevented further cases and ensured patient safety.

PRESENTED BY: DR NIC COETZEE

Keywords: Communicable diseases; Central Nervous System Infections; Prosthesis-related infections; Infection Control; Isolation

ESCAIDE reference number: 20110031

HEALTH CARE ASSOCIATED INFECTIONS

Hepatitis C virus (HCV) screening in pregnant women: Results of a sero-epidemiological survey of HCV antibodies among pregnant women at the Vienna General Hospital.

Diab-Elshahawi M*, Dosch V*, Honsig C**, Jatzko B***, Kiss H***, Presterl E*

AFFILIATIONS:

- * Clinical Institute of Hospital Hygiene, Vienna General Hospital, Medical University of Vienna
- ** Clinical Department of Virology, Vienna General Hospital, Medical University of Vienna
- *** Division of Obstetrics and Feto-Maternal medicine at the Department of Gynaecology, Vienna General Hospital, Medical University of Vienna

BACKGROUND:

A targeted 'risk-based' approach to HCV screening of pregnant women had so far been adopted at the Vienna General Hospital (VGH). Since May 2009 universal HCV screening of pregnant women presenting at the VGH has been implemented. The aim of our study was to compare the effectiveness of universal versus targeted HCV screening of pregnant women at the VGH.

METHODS:

Laboratory records of all HCV screened pregnant women presenting at the VGH between May 2009 and February 2011 were collected. Only pregnant women with HCV positive results were selected and their electronic patient records were subsequently evaluated for the presence or absence of risk factors for HCV.

RESULTS:

73 of the 4,222 screened pregnant women (= 1.7 %) were HCV antibody positive. In 67 of the 73 cases the HCV antibody status could be verified by a confirmatory HCV RNA polymerase chain reaction (PCR), while for the remaining 6 patients HCV RNA PCR was negative. Subsequent risk factor evaluation of medical histories did not show any risk factors for HCV infection in those 6 PCR negative patients but identified intravenous drug abuse in 53 of the 67 PCR positive patients (= 79 %). In 14 of the 67 PCR positive patients (= 21 %) the electronic health records were incomplete regarding information on possible HCV risk factors.

CONCLUSIONS:

Our study indicates that in our patient collective targeted 'risk-based' HCV screening would have identified the majority of HCV positive cases. Therefore risk factor evaluation seems to be a good surrogate for HCV screening.

PRESENTED BY: DR MAGDA DIAB-ELSHAHAWI

Keywords: Pregnancy; hepatitis C virus; screening

ESCAIDE reference number: 20110042

POSTER SESSION ABSTRACTS

HEALTH CARE ASSOCIATED INFECTIONS

Case-fatality and risk factors for death in adult patients with nosocomial infection caused by methicillin-resistant *Staphylococcus aureus* (MRSA) in Hungary, 2005–2010

Saverio Caini, (1–2), Á. Hajdu, (2), A. Kurcz, (2), K. Böröcz, (2)

AFFILIATIONS:

- 1 European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm
2. National Center for Epidemiology (NCE), Budapest, Hungary

BACKGROUND:

Nosocomial infections (NIs) due to MRSA are associated with longer hospital stay and worse outcome. In Hungary, patients with NIs caused by MRSA are notified to the National Nosocomial Surveillance System (NNSS) since 2004. We aimed at identifying their risk factors for death.

METHODS:

We conducted a retrospective cohort study including patients ≥ 18 years old, infected with MRSA notified to NNSS during 2005 to 2010. We calculated case-fatality ratios (CFRs) within seven and 30 days of microbiological diagnosis stratified by sex, age group and site of infection. We used Cox proportional hazards models to obtain hazard ratios (HRs) and 95% confidence intervals (CI) for death.

RESULTS:

Overall, 3014 patients (60% males, median age 67 years) were reported, 2412 (80%) with outcome data. CFRs at seven and 30 days were 18.9% and 36.0%, respectively. CFR at seven days was higher in females (21.2%; $p=0.02$), in ≥ 75 years olds (25.9%; $p<0.01$) and in those with pneumonia (37.1%; $p<0.01$) or bloodstream infection (27.9%; $p<0.01$). Independent risk factors for death were: presence of central venous catheter (HR 1.41, 95%CI 1.17–1.69) or endotracheal tube (HR 1.21, 95%CI 1.01–1.45); underlying chronic respiratory (HR 1.19, 95%CI 1.00–1.41) and cardiovascular (HR 1.26, 95%CI 1.08–1.46) diseases. Treatment at an infectious disease (ID) department (HR 0.34, 95%CI 0.20–0.57) or isolation (HR 0.45, 95%CI 0.36–0.58) reduced the patients' risk of dying in the first 15 and 30 days after microbiological confirmation, respectively.

CONCLUSIONS:

Our results indicate a variety of risk factors influencing the risk for death in patients infected with MRSA. When an MRSA infection is diagnosed, necessary infection control precautions should be implemented. An ID specialist should be consulted to tailor interventions and patient care in high-risk groups.

PRESENTED BY: DR SAVERIO CAINI

Keywords: Healthcare-associated infection, Multidrug resistance, Mortality, Case fatality ratio, Risk factors

ESCAIDE reference number: 20110052

HEALTH CARE ASSOCIATED INFECTIONS

Prevalence of and risks for internal contamination among hospital staff caring for a patient contaminated with a fatal dose of polonium-210 in London in November 2006

le Polain de Waroux O (1, 2), Cohuet S (1, 2), Bishop L (1), Johnson S (1), Shaw K, (1), Maguire H (1), Charlett A (3), Fraser G (1).

AFFILIATIONS:

1. Health Protection Agency, London and South East Regional Epidemiology Units 151 Buckingham Palace Road, London, SW1W 9SZ, UK
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Control and Prevention, Tomtebodavägen 11A, 171 65 Solna, Stockholm, Sweden
3. Health Protection Agency, Statistics, Modelling and Economics Department, Centre for Infections, 61 Colindale Avenue, London NW9 5EQ, UK

BACKGROUND:

Alexander Litvinenko (AL) died on 23 November 2006 from acute radiation sickness syndrome, caused by ingestion of polonium-210 (^{210}Po). The objective was to assess the prevalence of and risk factors for internal contamination with ^{210}Po in health care workers (HCWs) caring for Mr Litvinenko in order to enable better protection of any hospital staff exposed in similar ways in future.

METHODS:

We conducted a retrospective cohort including staff from 2 hospitals reporting direct contact with AL and completing a 24h urine test for ^{210}Po . We interviewed staff about clinical and non-clinical activities and use of personal protective equipment (PPE). Internal contamination was defined as urinary ^{210}Po excretion above 20milibecquerels/24h. We obtained Risk ratios (RR) for internal contamination using Poisson regression.

RESULTS:

Forty-three HCWs were included and 37 (86%) responded, of which eight (22%) showed evidence of internal contamination, all at very low levels unlikely to cause adverse health outcomes ($<6\text{mSv}$). Daily care of the patient (washing and toileting the patient) was the main risk factor (RR 3.6, 95%CI 1.1 – 11.6). In contrast planned invasive procedures were not associated with a higher risk. There was some evidence of an increased risk associated with handling blood samples (RR 3.5 95%CI 0.8 – 15.6); changing urine bags and/or taking urine samples (RR 2.7, 95%CI 0.8 – 9.5); and reporting not always using standard PPE (RR 2.5, 95%CI 0.8 – 8.1).

CONCLUSIONS:

The sensitive quantitative measurement enabled us to identify factors associated with contamination, which by analogy to other conditions with similar transmission mechanisms may help improve protection and preparedness in staff dealing with an ill patient suffering an unknown illness.

PRESENTED BY: DR OLIVIER LE POLAIN DE WAROUX

Keywords: Polonium-210, contamination risk factors, health care workers

ESCAIDE reference number: 20110055

HEALTH CARE ASSOCIATED INFECTIONS

Aosta regional Hospital: hygiene survey in the operating theatre.

Roberto Novati, MG Canta, M Mastaglia, C Galotto

AFFILIATIONS:

Medical Direction. Aosta regional Hospital, Italy. rnovati@ausl.vda.it

BACKGROUND:

Close monitoring of health care workers (HCW's) behaviours in a given setting is difficult to complete. Aim of our study was to analyze HCW's hygiene behaviours in the operating theatre of a middle size Hospital.

METHODS:

A 430 beds, tertiary care Hospital, 113 surgery beds, 3700 surgical interventions in 2010, 5 operating rooms. The following behaviours were investigated, by means of home-made check lists (number of explored items in brackets): A- surgical staff dressing, preparation and hygiene (7), access to the theatre (3) B- hand washing (9) C- surgical field preparation (5) D- traffic in- and -outside the theatre E- cleaning procedures (6). Whole study was completed over one-month period, HCW's had been previously informed.

RESULTS:

33 surgical interventions covering all available surgical specialties were observed, with 3255 minutes of survey and 207 HCW's looked at. Mean HCW's adherence score was the following: dressing 100%, preparation and hygiene 70%, access to the theatre, surgical hand washing 73,5%, surgical field preparation 93%; the mean staff in the operating room was 5,7, with a mean of 21 passages for intervention. Mean score for cleaning and sanitization activities was 85,4%. Results were reported and in-depth discussed with HCW's, leading to a 25 items implementation list.

CONCLUSIONS:

our approach allows a broad coverage of the surgical area, unexpensive and relatively easy to perform. Since our analysis a fine tuning of most behaviours in the given setting is available, leading to the "molecular" definition of single items to be improved and/or corrected. Next, the check lists method allows follow up of many indicators. Finally, the proposed approach consent in-depth discussion with HCW's, leading to a multifaceted improvement strategy.

PRESENTED BY: DR ROBERTO NOVATI

Keywords: Operating theatre

ESCAIDE reference number: 20110105

HEALTH CARE ASSOCIATED INFECTIONS

Healthcare-Associated Bloodstream Infections in Finland 1999–2008 – Ranking Hospitals by Staphylococcus Aureus Bacteremias

Tommi Kärki, J. Olgren, T. Möttönen, O. Lyytikäinen and the Hospital Infection Surveillance Team

AFFILIATIONS:

National Institute for Health and Welfare (THL), Helsinki, Finland

BACKGROUND:

Surveillance of healthcare-associated bloodstream infections (BSI) in all specialities was introduced as a part of the Finnish Hospital Infection Program in 1999. BSIs, especially Staphylococcus aureus bacteremias (SAB), are often severe and also relatively often preventable. The objective of this study was to analyze the Finnish surveillance data from years 1999–2008 in order to assess hospital ranking according to rates of BSIs versus SABs.

METHODS:

Twelve Finnish hospitals conducted prospective incidence surveillance for healthcare-associated BSIs 1999–2008. Centers for Disease Control and Prevention definitions and common protocol for laboratory-based case finding were used. Patient-days were obtained from hospitals' information technology departments to calculate incidence densities (ID) with 95% confidence intervals (CI). The correlation between the ranking positions was investigated by Spearman's correlation coefficient.

RESULTS:

We identified 9192 BSIs, of which 1317 were SABs. Overall BSI IDs per 10,000 patient-days varied from 1.89 to 8.96 between hospitals. In the BSI ranking, there were clear differences in ID without overlapping of CIs. For SAB, IDs per 10,000 patient-days varied from 0.49 to 1.32. The correlation coefficient of the two rankings was 0.76. Four hospitals had one position lower and two hospitals two or more positions lower in the SAB ranking, but there was overlapping of CIs in most of the cases.

CONCLUSIONS:

The SAB ranking may help in identifying additional outliers. This indicates that in some cases SABs could be used as an indicator for hospital performance, enhancing the use of surveillance data in infection control. However, the SAB ranking must be interpreted with caution, as CIs overlap significantly, and therefore its use as an indicator in a shorter period, for example one year, might be difficult.

PRESENTED BY: MR TOMMI KÄRKI

Keywords: Bacteremia, surveillance, incidence, quality indicators

ESCAIDE reference number: 20110146

POSTER SESSION ABSTRACTS

HEALTH CARE ASSOCIATED INFECTIONS

Evolution of factors associated with non-compliance of recommendations on hand hygiene

Cesar Villanueva-Ruiz, C. Martínez-Ruiz, M.J. Molina-Gómez, L. García-López, M. González-Hernández, C. García-González, C. Escrivá-Pons, J. Sánchez-Payá.

AFFILIATIONS:

Epidemiology Unit. Preventive Medicine Service. University General Hospital of Alicante.

BACKGROUND:

Hand hygiene (HH) is the most important measure to prevent healthcare-associated infections. The aim of this work is to study the time evolution of the factors associated with not compliance with the HH.

METHODS:

During 2005–2010, we have measured the degree of compliance of recommendations on HH by direct observation in six occasions (December/2005-February/2006, October-November/2006, June-November/2007, June-December/2008, June-December/2009 and January-July/2010). For every opportunity to carry out HH, variables associated with the person who performs the activity, the observation period and the activity itself (sex, age, attendance at refresher sessions, use of pocket-sized bottles, knowledge of the triptych on HH, attendance area, activity -before/after-, work overload, patients with contact precautions and use of gloves) were collected. For the association study, chi-square test has been used, and to quantify the magnitude of the association, the odds ratio with 95% CI has been used; calculated crude and adjusted with a Logistic Regression model.

RESULTS:

Factors independently associated with not performing HH in 2005: being male, OR:1.3 (1.1-1.7); absence in refresher sessions, OR:1.4 (1.2-1.7); pocket-sized bottle not available, OR:2.3 (1.7-3.3); medical area, OR:2.0 (1.6-2.4); activity before, OR:3.2 (2.4-4.2); work overload, OR:2.0 (1.6-2.4); patient on contact precautions, OR:0.3 (0.2-0.6); use of gloves, OR:2.2 (1.6-3.2). In 2010, absence in refresher sessions, OR:1.2 (1.0-1.6); pocket-sized bottle not available, OR:2.5 (2.0-3.1); not knowing the triptych on HH, OR:1.7 (1.1-2.6); medical area, OR:3.4 (2.7-4.3); activity before, OR:1.7 (1.4-2.1); use of gloves, OR:3.7 (2.9-4.7).

CONCLUSIONS:

Most of the factors associated with not proceeding with HH, remain stable over time, although there are factors that lose this association with the time, and new ones appear over it. This information is crucial for planning intervention strategies to improve the degree of compliance with recommendations on HH.

PRESENTED BY: DR CESAR VILLANEUVA-RUIZ

Keywords: Hand Hygiene; Compliance; Epidemiologic Determinants; Program Evaluation

ESCAIDE reference number: 20110180

HEALTH CARE ASSOCIATED INFECTIONS

Suitability of conventional healthcare-associated infections (HCAI) case definitions for E. coli bacteraemia prior to implementation of mandatory surveillance, England 2011

Berit Muller-Pebody (1), C. Jeppesen (1, 2), A. Claxton (3), K. L. Henderson (1), J. Davies (1), E. Sheridan (1)

AFFILIATIONS:

1. Healthcare Associated Infections and Antimicrobial Resistance Department, Health Protection Agency, London, England
2. Western Sussex Hospitals NHS Trust, Chichester, England
3. Homerton University Hospital NHS Foundation Trust, London, England

BACKGROUND:

Voluntary laboratory reports of bloodstream infections due to *Escherichia coli* increased by 35% from 2006 to 2010 in the United Kingdom compared with 0.2% for all bacteraemia. Given this rise and increasing antibiotic resistance rates among Gram-negative organisms, mandatory laboratory reporting for England was extended to include *E. coli* bacteraemia from June 2011. We analysed data on hospital patients with *E. coli* bacteraemia to assess suitability of conventional HCAI case definitions for the surveillance protocol prior to implementation of the mandatory surveillance scheme.

METHODS:

The study used linked retrospective laboratory and clinical records on all cases of *E. coli* bacteraemia at a London hospital, May 2005-April 2010. Time-based definitions for hospital-acquired (HA) and community-onset (CO) *E. coli* bacteraemia were used. A mixture of two normal distributions was fitted to the data to assess suitability of the definitions. Descriptive analysis of a further case definition for *E. coli* bacteraemia (healthcare-acquired community onset [HACO] i.e. previous hospital admission in preceding year) was performed.

RESULTS:

From April 2005-April 2010, 476 cases of *E. coli* bacteraemia occurred at the hospital (10–11% of all positive blood cultures annually). Seventy-four percent of cases fulfilled definition for CO. Mixture of two normal distributions showed that 69% of the distribution was explained with normal distribution centred around day 0 of hospital admission (mean 0, standard deviation 0.4). Among cases of CO *E. coli* bacteraemia, 39% were HACR.

CONCLUSIONS:

Earlier cut-off than used for conventional HCAI case definitions may be more appropriate for surveillance of *E. coli* bacteraemia. In order to identify which *E. coli* bacteraemias are healthcare-acquired, and potentially preventable, a surveillance programme should gather information on procedures and devices, in hospital and the community.

PRESENTED BY: DR BERIT MULLER-PEBODY

Keywords: *Escherichia coli*, Public Health Surveillance, Sepsis

ESCAIDE reference number: 20110242

HEALTH CARE ASSOCIATED INFECTIONS

Epidemiological investigation of an outbreak of PVL methicillin-sensitive Staphylococcus aureus in a neonatal unit in London, 2011

Arnaud Le Menach (1, 2), J. West (3), G. G. Rao (3), F. Coogan (3), N. Richard (3), B. Patel (4), N. Boxall (1), H. Maguire (1), C. Seng (5), P. Crook (1)

AFFILIATIONS:

1. Health Protection Agency, London Regional Epidemiology Units, 151 Buckingham Palace Road, London, SW1W 9SZ, England, UK
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Control and Prevention (ECDC) Stockholm, Sweden
3. North West London Hospital NHS Trust, Watford Road, Harrow, Middlesex, HA1 3UJ
4. Health Protection Agency Center for Infection, 61 Colindale Avenue, London NW9 5HT
5. North West London Health Protection Unit, Health Protection Agency, 61 Colindale Avenue, London, NW9 5EQ

BACKGROUND:

In January 2011, an increasing number of babies with pustules were observed within the neonatal unit of a general hospital in London. Swabs were taken and were positive to Panton-Valentine Leukocidin Methicillin-Sensitive Staphylococcus Aureus (PVL-MSSA), triggering an outbreak investigation to determine the extent of the outbreak, identify associated risk factors and make recommendations for control.

METHODS:

We conducted a retrospective cohort study among all infants admitted to the neonatal unit between 12 December 2010 and 7 February 2011. Cases were defined as infants with clinical infections (clinically diagnosed with skin infections and tested positive for PVL-MSSA). Information was collected from medical records on demographics, laboratory results, timelines, and birth factors. Univariate analysis was performed to calculate Attack Rate (AR), Relative Risk (RR), and 95% confidence intervals (95% CI).

RESULTS:

Twelve cases were identified from 86 infants admitted to the unit (AR=14%). Moderately (32 to 33 weeks of gestation) and severely (28 to 31 weeks) premature infants were 6.0 (95% CI: 1.3-27.8) and 5.1 (95% CI: 1.1-25.3) times more at risk of being clinically infected than non-premature infants (more than 36 weeks), respectively. Caesarean-section (RR=2.6; 95% CI: 0.8-8.9) was not found associated with clinical infection.

CONCLUSIONS:

Clinical infections in premature infants may be explained by an increased susceptibility to infection or increased nursing and medical care. The unit was closed to new admissions and standard infection control measures were implemented. The study identified which infants were potentially most at risk, enabling staff to enhance infection control measures among very premature infants.

PRESENTED BY: DR ARNAUD LE MENACH

Keywords: Methicillin-Sensitive Staphylococcus aureus, Panton-Valentine Leukocidin, Disease Outbreaks, Healthcare Associated Infections, Case-Control Studies, Premature Infant

ESCAIDE reference number: 20110288

HEALTH CARE ASSOCIATED INFECTIONS

Knowledge, attitudes and reported practices about health care-associated infections among health care workers in a teaching hospital in Ujjain, India

Vishal Diwan (1, 2)*, Senia Rosales-Klitz (1)*, H Shah (3), R. Joshi (3), M. Sharma (1, 5), A. Pathak (6), J. Struwe (7), A. J. Tamhankar (8, 9), C. Stålsby Lundborg (1) * contributed equally

AFFILIATIONS:

1. Division of Global Health (IHCAR), Department of Public Health Sciences, Karolinska Institutet, Stockholm, Sweden
2. Department of Public Health & Environment, R.D. Gardi Medical College, Ujjain, India
3. Department of Microbiology, R.D. Gardi Medical College, Ujjain, India
4. Department of Community Medicine, R.D. Gardi Medical College, Ujjain, India
5. Department of Pharmacology, R.D. Gardi Medical College, Ujjain, India
6. Department of Pediatrics, R.D. Gardi Medical College, Ujjain, India
7. Swedish Institute for Communicable Disease Control, Solna, Sweden
8. Department of Environmental Medicine, R.D. Gardi Medical College, Ujjain, India
9. Indian Initiative for Management of Antibiotic Resistance (IIMAR), Mumbai, India

BACKGROUND:

Health care-associated infections (HAI) are a silent epidemic that threatens patient's safety, especially in settings with limited resources. As part of the baseline evaluation of an ongoing intervention study, we performed a questionnaire survey to assess knowledge and to explore attitudes and reported practices regarding HAI among health care workers (HCW) in a teaching hospital in India.

METHODS:

This was a cross-sectional study conducted in Ujjain district, Madhya Pradesh, India August-October 2010. The setting was a 570-bed rural teaching hospital associated to the R.D. Gardi Medical College. Participants were doctors (n=46), medical students (n=51), nurses (n=93) and other HCW (n=11) involved in direct patient care. The interviewer-administrated questionnaire comprised mainly closed-ended questions and was presented in English, Hindi or Malayalam. The sum of correct answers divided by the total number of items (n=53) was used as knowledge score. Participation was voluntary and responses were confidential. Ethical approval was granted by the institutional ethics committee.

RESULTS:

The majority of the respondents (95%) acknowledged the importance of HAI prevention and more than 80% of them recognized the negative consequences associated to HAI occurrence. Similarly, 96% of the participants considered hand washing, glove use and general cleanliness as recommended preventive measures. Self-reported compliance of "always" using hand washing was 60%. Only 28% of the participants recognized the role of HCW's hands as main transmission route for HAI. The overall knowledge score was 0.69 (SD=0.16). Nurses had a significantly lower score (0.60, SD=0.18) when compared to doctors (0.76, SD=0.09) and medical students (0.77, SD=0.08).

CONCLUSIONS:

These findings highlight the need of context-relevant interventions targeting different professional groups and are emphasizing the importance of increased hand hygiene compliance.

PRESENTED BY: DR SENIA ROSALES-KLITZ

Keywords: India, health care-associated infections, hand hygiene, knowledge, attitudes

ESCAIDE reference number: 20110295

POSTER SESSION ABSTRACTS

HEALTH CARE ASSOCIATED INFECTIONS

Pseudo-outbreak of *Fusarium solani* in a burns unit

Verena Spertini (1), M. Diab-Elschahawi (1), S. Baumgärtner (1), A. Wagner (1), B. Willinger (2), E. Presterl (1)

AFFILIATIONS:

1. Clinical Institute of Hospital Hygiene, Vienna Medical University, Vienna, Austria
2. Department of Clinical Microbiology, Vienna Medical University, Vienna, Austria

BACKGROUND:

Fusarium solani is found ubiquitously in the environment. It is a pathogen for plants and can also cause opportunistic infections in immunocompromised patients. Recently our inhouse infection surveillance detected an accumulation of *Fusarium solani* reports at the burns unit within a short time. Further investigation showed that affected patients had stayed in the same room, however not at the same time. Burn patients are mostly casualties and therefore wounds might be colonised with fungi upon admission. As *F. solani* is a rare wound contaminant, we presumed a common source in the hospital. The aim of the study was to clarify the epidemiological connection between these cases.

METHODS:

Environmental sampling was performed taking Sabouraud-agar contact cultures from the roller blinds of the involved room as well as from the leaf, the bark and the hydroponics clay pebbles of plants in the staffroom. Clay pebbles and bark were also enriched in Sabouraud-Bouillon. Additionally air sampling was done with RCS Microbial Air Sampler (Biotest HYCON®) using Rose Bengal Agar strips. Subsequently environmental and patient's findings were compared by genotyping (DiversiLab™, bioMérieux).

RESULTS:

Of all environmental samples taken only the bark of one plant cultured in Sabouraud-Bouillon showed growth of *F. solani*. The contact cultures presented growth of other fungi but not *F. solani*. Air sampling cultures were negative. No epidemiological correlation could be established by genotyping.

CONCLUSIONS:

Traditional epidemiological and microbiological methods would have demonstrated a nosocomial outbreak. Eventually it was the genotyping which revealed a pseudo outbreak. The DiversiLab™ proved to be an important tool for rapid outbreak investigation involving environmental samples. In our opinion infection control measures should ensure the ban of plants in burns units- even in staffrooms.

PRESENTED BY: MISS VERENA SPERTINI

Keywords: *Fusarium solani*, outbreak investigation, Burns unit, Nosocomial infection

ESCAIDE reference number: 20110308

HEALTH CARE ASSOCIATED INFECTIONS

Nosocomial outbreaks of *Clostridium difficile* infection – a rapidly emerging problem in Hungary

Ágnes Hajdu, K. Böröcz, A. Szőnyi

AFFILIATIONS:

National Center for Epidemiology, Dept. of Hospital Epidemiology and Hygiene, Budapest, Hungary

BACKGROUND:

In recent years, many industrialised countries have reported increased *Clostridium difficile* infections (CDI) and outbreaks, mainly attributed to the emergent PCR-ribotype 027 strain. In Hungary, voluntary reporting of nosocomial CDI-cases was established in 2009 and enhanced in March 2011. We analysed nosocomial outbreaks, which have been notifiable for decades, to better understand the hospital epidemiology of CDI in Hungary.

METHODS:

We reviewed nosocomial outbreaks reported during January 1986 to June 2011 to the national level. Time trends of *C. difficile*, rotavirus and *Salmonella* spp. outbreaks were compared to account for possible reporting bias. Characteristics of CDI outbreaks were further described.

RESULTS:

In the given period, trends of nosocomial *C. difficile*, rotavirus and *Salmonella* spp. outbreaks differed markedly. Two CDI outbreaks were reported before 2010, 9 outbreaks in 2010, and 14 in 2011 until June. The 25 CDI outbreaks represented 270 cases (267 in-patients and 3 healthcare workers) and 18 deaths (6.7%). The median duration of outbreak was 17 days (range 5–84), the median number of cases per outbreak was 10 (range 2–27). Index case was identified in 8 outbreaks, transmission by both direct and indirect contact was indicated in 15 outbreaks. Mostly internal medicine departments were affected (56%). Fourteen hospitals and six university clinics in 7 of the 19 Hungarian counties sent reports; notifications were mainly from the capital (44%). Typing results were available in two outbreaks in 2010 where PCR-ribotype 027 strains were identified.

CONCLUSIONS:

In Hungary, the number of reported nosocomial CDI outbreaks has sharply increased since 2010. National guidelines for prevention and management of CDI issued in March 2011 included recommendations for outbreak control. Continuing and concerted efforts are needed to prevent spreading of CDI in hospitals.

PRESENTED BY: MS ÁGNES HAJDU

Keywords: *Clostridium difficile* infection, outbreak, nosocomial

ESCAIDE reference number: 20110350

HIV – STI

School-based Chlamydia trachomatis testing in North Norway – suitable for reaching adolescent boys

Kirsten Gravingen (1, 2) G. S. Simonsen (1, 2) A.–S. Furberg (1, 2)

AFFILIATIONS:

1. Department of Microbiology and Infection Control, University Hospital of North Norway, Tromsø, Norway
2. Faculty of Health Sciences, University of Tromsø, Tromsø, Norway

BACKGROUND:

The *C. trachomatis* incidence rate (number of cases per 100 000 inhabitants per year) in Finnmark, the most northern and sparsely populated county in Norway, has been twice the national average. We aimed to: i) determine the chlamydia prevalence among adolescents aged 15 – 19 years in this high incidence area, and ii) examine the acceptability of school-based chlamydia testing.

METHODS:

This population based cross-sectional study inviting all high-school students in five Finnmark towns including a web-based questionnaire and first-void urine samples was conducted during class-hours in the fall 2009 (participation rate 85%, n=1618, girls 800/boys 818, mean age 17.2 years). *C. trachomatis* was detected using real-time PCR (ProCelo as, Tromsø, Norway). Proportions were compared using chi-square test.

RESULTS:

A urine sample was provided by 93% of those reporting sexual intercourse experience (no gender difference). Among these, chlamydia prevalence was 5.6% (girls 7.1%, boys 3.9%, p=0.03). 73% of sexually active participants (girls 78%, boys 67%, p<0.001) were happy to be offered chlamydia testing at school. 59% of the sexually active had not been tested previously (girls 40%, boys, 60%, p<0.001). Among participants testing positive (n=60), 49% reported not being tested prior to this study (girls 44%, boys 61%, ns).

CONCLUSIONS:

Girls having twofold higher chlamydia prevalence than boys may be due to gender differences in sexual behaviour (i.e. debut age, number and age of partners). The high participation rate indicates that school-based testing is well suited for sexually active adolescents this age, especially for boys who provided 46% of the study samples. According to Norwegian laboratory-based surveillance data, boys provided <20% of samples tested for genital chlamydia infection among the 15 – 19 year olds in 2009.

PRESENTED BY: MR KIRSTEN GRAVNINGEN

Keywords: Chlamydia, cross-sectional survey, adolescents

ESCAIDE reference number: 20110011

HIV – STI

Sexually transmitted infections among men who have sex with men living in Western Sicily (south Italy)

Florinda Di Piazza, Maria Antonella Di Benedetto, Emanuele Amodio, Vincenza Aratore, Alberto Firenze

AFFILIATIONS:

Department for Sciences of Health Promotion 'G. D'Alessandro', University of Palermo (Italy) Azienda Ospedaliera Universitaria Policlinico 'P. Giaccone', Palermo (Italy)

BACKGROUND:

Sexual activity has been shown to be the primary mode of transmission for several important viral, bacterial and parasitic infections among men who have sex with men (MSM) throughout the world.

METHODS:

Because few epidemiological data on the sexually transmitted infections (STIs) among Sicilian MSM population are available, a cross-sectional study was conducted to assess the prevalence of STIs among MSM living in Western Sicily. Seventy four MSM with median age of 30 years old, were recruited via networks; 15.1% (n=11) were bisexual men. All participants were interviewed by anonymous self-administered questionnaires in order to collect social/demographic information and STIs-related risky sexual behaviours. Blood samples were collected from each subject and tested for HIV, HCV, HHV8 and syphilis antibodies; the presence of *Giardia* and *Cryptosporidium* was detected in faecal samples by immunofluorescence assay.

RESULTS:

The prevalence of HIV, HHV8, *T. pallidum* and *Giardia duodenalis* infections were 8.1%, 13.5%, 21.6% and 16.4% respectively; all patients were negative for HCV and *Cryptosporidium* infections. A small proportion of the study population (7%) never used condom and slightly less than half (50.7%) sometimes used it while 42.3% always used it. All HIV+ MSM and 7 (43.7%) syphilis seropositives were unaware of their own infection.

CONCLUSIONS:

Oral-anal contact during sex may be the main transmission route both of HHV8 and of enteropathogens like *Giardia duodenalis*. Because MSM living in Western Sicily are a high risk for important STIs the behavioural prevention remains central to halt the spread of these STIs among MSM.

PRESENTED BY: DR EMANUELE AMODIO

Keywords: MSM; STIs; Sicily

ESCAIDE reference number: 20110068

POSTER SESSION ABSTRACTS

HIV – STI

Prevalence of Pharyngeal and Rectal *Neisseria Gonorrhoea* and *Chlamydia Trachomatis* Infections among Men Who Have Sex with Men in Germany

Sandra Dudareva (1, 2), K. Haar (3), A. Sailer (3), H. Wisplinghoff (4), F. Wisplinghoff (4), U. Marcus (3) and the PARIS study group

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Postgraduate Training for Applied Epidemiology (PAE, German FETP), Robert Koch-Institute, Berlin, Germany
3. Department for Infectious Disease Epidemiology, Robert Koch Institute, Berlin, Germany
4. Laboratoriumsmedizin Köln – Drs. Wisplinghoff and Colleagues, Cologne, Germany

BACKGROUND:

We determined the prevalence of pharyngeal and rectal *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (NG) infections among Men Who Have Sex with Men (MSM) and described association between these infections and sexual practices, and other factors in order to better understand the need for routine screening.

METHODS:

We conducted a cross-sectional study in 22 STI-Sentinel sites across Germany between August 2009 and December 2010. Pharyngeal and rectal swabs were tested for CT and NG with a nucleic acid amplification test. Self-administered questionnaires with questions on HIV status, number of sex partners in the last six months, sexual practices, use of condoms and age were collected. Logistic regression was used for univariable and multivariable analysis; significance level was set at 0.05.

RESULTS:

Altogether 2,247 MSM were screened for pharyngeal or rectal CT and NG infections; median age was 34 years (range 16–83). Prevalence of CT was 1.5% (32/2,197) in pharyngeal and 8.0% (164/2,050) in rectal specimens. Prevalence of NG was 5.5% (121/2,197) in pharyngeal and 4.6% (95/2,050) in rectal specimens. Local symptoms were reported only in 5.1% pharyngeal and 11.9% rectal infections. Rectal infection was significantly more likely in those reporting multiple partners (2–5 partners OR=1.88, 6–10 partners OR=2.07, >11 partners OR=2.78), the HIV-positive (OR=1.86), and those practising passive anal intercourse (OR=1.61). Pharyngeal infection was significantly more likely in those having multiple partners (6–10 partners OR=2.58, >11 partners OR=4.47), the HIV-positive (OR=1.78), and those practising active anilingus (OR=1.95).

CONCLUSIONS:

Pharyngeal and rectal infections in sexually active MSM can remain undetected and thus transmissible if swabbing is not offered routinely. Screening is particularly important for HIV-positive MSM and those who do not live in a monogamous relationship.

PRESENTED BY: MS SANDRA DUDAREVA

Keywords: *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, pharyngeal, rectal, MSM, screening

ESCAIDE reference number: 20110070

HIV – STI

Where do people with gonorrhoea in London travel to seek care? An analysis of surveillance data in London, 2009–10

le Polain de Waroux O. (1,2), Maguire H. (1), Crook P. (1)

AFFILIATIONS:

1. Health Protection Agency, London and South East Regional Epidemiology Units 151 Buckingham Palace Road, London, SW1W 9SZ, UK
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Control and Prevention (ECDC), Sweden

BACKGROUND:

Provision of care for people with gonorrhoea in London is mainly through Genitourinary Medicine (GUM) clinics. We aimed to examine distance travelled for care by gonorrhoea patients and explore factors associated with attending non-local GUM services in order to inform service planning.

METHODS:

We obtained surveillance data for 2009–10, including patients' residence at the census area level (median 1,500 individuals). Census area variables were obtained from the Office for National Statistics. Non-local GUM clinics defined as those located at >1km from the nearest GUM clinic. Adjusted Risk Ratios (aRRs) for attending non-local services were obtained by Poisson regression.

RESULTS:

Of the 11,541 patients (male 73%, $p < 0.001$) recorded 48% attended non-local services. Median distance to clinics was 2.3km (range 0 – 11.3km). Prevalence of non-local service attendance varied widely across areas ($p < 0.001$). Due to interaction females and males were studied separately. Gonorrhoea was associated with age (compared to <20s, aRR (95%CI) for ≥ 20 s in males and females was 1.30 (1.16 – 1.47) and 1.14 (1.01 – 1.27)), men who have sex with men (aRR 1.17; 1.10 – 1.24), and ethnicity (Asians vs. White males (aRR 0.81; 0.70 – 0.93) and Caribbean vs. white White females (aRR 1.25 (1.10 – 1.43)). Gonorrhoea in females was associated with living in an area where average distance to work was higher (aRR for increasing quintiles of distance 1.12 (1.07 – 1.17)).

CONCLUSIONS:

Almost half the patients sought care beyond their local service. This varied widely according to residence, ethnic and age group and sexual orientation. Interpretation was limited by the absence of information on where people work and on the reasons for choosing non-local services. Nonetheless, our findings indicate that services may not meet the needs of particular groups.

PRESENTED BY: DR OLIVIER LE POLAIN DE WAROUX

Keywords: Gonorrhoea, GUM services

ESCAIDE reference number: 20110096

HIV – STI

High Prevalence of HIV, Other Sexually Transmitted Infections and Risk Profile in Male Commercial Sex Workers Who Have Sex With Men in The Netherlands

Willem-Jan SS Cuypers (1), Anne-Marie Niekamp (1, 2), Renee JH Keesmeekers (1), Laura WL Spauwen (1), Dési LF Hollman (1), Daisy MJ Telg (1), Nicole HTM Dukers-Muijers (1, 2), Christian JPA Hoebe (1, 2)

AFFILIATIONS:

1. Department of Infectious Diseases, South Limburg Public Health Service, The Netherlands, P.O. Box 2022, 6160 HA Geleen, The Netherlands.
2. Department of Medical Microbiology, Maastricht Infection Centre, Maastricht University Medical Centre (MUMC+), School for Public Health and Primary Care (CAPHRI), P.O. Box 5800, 6200 AZ Maastricht, The Netherlands.

BACKGROUND:

Little is known about the epidemiology and burden of sexually transmitted infections (STI) in male commercial sex workers who have sex with men (M\$M) in Western countries. M\$M are often hard to reach for prevention and STI testing. This study aimed to reach M\$M, assess their socio-demographics and prevalence of STI, and their risk profile.

METHODS:

Retrospective, cross sectional study. Demographic and STI-diagnosis data were retrieved from standardized medical records of M\$M consulted during outreach activities by our public health STI-clinic in 2009/2010. Chlamydia trachomatis (CT) and Neisseria gonorrhoeae (NG) were diagnosed by NAAT and serology was performed for HIV, syphilis and hepatitis B.

RESULTS:

We included all 139 consultations by 99 M\$M. Median age was 24 years; 56% of participants were of Romanian nationality, 20% other (East) European, 16% South American and 8% Dutch nationality. Of participants, 50% self identified as homosexual, 33% bisexual and 17% heterosexual. Results of STI-testing at first time consultation revealed 46% diagnosed with at least one STI: infection with CT was most prevalent (18%), followed by NG (12%), HIV (11%) and 24% had evidence of syphilis of whom 50% was infectious. Of participants, 28% had previous exposure to hepatitis B virus; 8% was infectious and 24% was fully vaccinated against hepatitis B.

CONCLUSIONS:

Identification and recruitment for STI testing and prevention of this population at high risk for STI is shown feasible. Follow-up and retention appears to be a challenge. M\$M pose a very high risk for STI acquisition and a transmission risk regarding M\$M users. Further research is urgently required to address the needs of M\$M and explore prevention strategies. Furthermore, targeted health education to encourage safer sex is needed.

PRESENTED BY: DR CHRISTIAN HOEBE

Keywords: STI; escort MSM; M\$M

ESCAIDE reference number: 20110103

HIV – STI

Systematic Selection of Screening Participants by Risk Score in Chlamydia Screening Programme is Feasible and Effective

Christian JPA Hoebe (1), Elfi EHG Brouwers (1), Jan EAM van Bergen (2), Johannes SA Fennema (3), Hannelore M Götz (4), Rik H Koekenbier (3), Eline LM Op de Coul (5), Lydia Pars (2), Sander M van Ravesteijn (4), Ingrid VF van den Broek (5)

AFFILIATIONS:

1. Department of Infectious Diseases, South Limburg Public Health Service, Geleen, the Netherlands
2. STI AIDS Netherlands, Amsterdam, the Netherlands
3. Cluster of Infectious Diseases, Department of Research, Online Research and Prevention Unit, Amsterdam Health Service, Amsterdam, the Netherlands
4. Division of Infectious Disease Control, Rotterdam Rijnmond Public Health Service, Rotterdam, the Netherlands
5. Epidemiology & Surveillance Unit, Centre for Infectious Disease Control, National Institute of Public Health and the Environment, Bilthoven, the Netherlands

BACKGROUND:

Systematic screening for Chlamydia by individual invites ensures general reach, but is less (cost)effective, as it includes people at no or low risk. Selective systematic screening can overcome this. In a large-scale Chlamydia Screening programme in the Netherlands selection by risk score was applied in one region where relatively low prevalence was expected. Here we show the effect of selection on participation, positivity and acceptability in three screening rounds.

METHODS:

Invitees were alerted by personal letter to login to www.chlamydiatst.nl and fill in an 8-item questionnaire before a test could be requested. Questions, based on a prediction rule assessed in a previous study, addressed age, place of residence, education, ethnicity, symptoms, condom use and sex partners. Answers yielded different points accumulating in a risk score. Only invitees with sufficient score of 6 or more could proceed and receive a testkit.

RESULTS:

Selection led to exclusion of 36% of potential participants and positivity rate of 4.8% among participants (versus 2% population prevalence in previous study). Women scored on average higher than men (6.6 with 95%CI:6.5-6.7 versus 5.8 with 95%CI5.7-5.9, $p < 0.001$). Higher scores were clearly related to higher positivity rates. Excluded participants had significantly lower response to the invitation of the second round (21% versus 29%, $p < 0.01$). An acceptability questionnaire among excluded participants ($n=67$, response 34%) revealed disappointment about exclusion in 30% but high acceptability of the screening set-up; 8% still went to GP or STI centre for Ct testing.

CONCLUSIONS:

Systematic selection of screening participants by risk score in Chlamydia screening is feasible and successful in realizing higher positivity rates than without selection. Acceptability of selection is high but could still be improved by better communication on expectations.

PRESENTED BY: DR CHRISTIAN HOEBE

Keywords: Chlamydia screening risk score selection

ESCAIDE reference number: 20110159

POSTER SESSION ABSTRACTS

HIV – STI

Estimating the number of undiagnosed people with HIV infection in Lazio, Italy, using surveillance data

Alessia Mammone (1), Patrizio Pezzotti (2), Claudio Angeletti (1), Nicoletta Orchi (1), Enrico Girardi (1)

AFFILIATIONS:

1. National Institute for Infectious Disease, IRCSS “L. Spallanzani”, Rome, Italy.
2. Lazio Sanità – Agenzia di Sanità Pubblica (Public Health Agency), Rome, Italy.

BACKGROUND:

The number of HIV+ undiagnosed people is usually estimated by prevalence surveys or backcalculation methods, but selection bias and statistical complexity limit these approaches. We report estimates of undiagnosed HIV+ people living in Lazio region, Italy, using an alternative method (Lodwick et al. AIDS;2011;25:1017–1023).

METHODS:

Each year, a proportion of the undiagnosed population has a simultaneous HIV/AIDS diagnosis. Assuming that the CD4-count distribution of people with undiagnosed HIV is well approximated by that of those with newly diagnosed asymptomatic HIV and given that the incidence of AIDS at a certain CD4-count is known from cohort studies, the number of people with undiagnosed HIV can be estimated dividing the number of people with simultaneous HIV/AIDS diagnoses by the expected incidence of simultaneous HIV/AIDS diagnoses calculated using the CD4 distribution. The distribution of CD4-count in newly asymptomatic HIV+ people and the number of simultaneous HIV/AIDS diagnoses were obtained by the surveillance system in 2004–2008.

RESULTS:

During the period 3866 (mean per year: 770) undiagnosed people were estimated with a peak of 932 in 2006. By behavioural risk factor Men-who-have sex-with-men (50%) had the higher percentage of undiagnosed, followed by heterosexual contacts (40%) and Injecting-drug-users (10%). By gender and nationality, males (82%) and Italians (64%) had the higher percentage of undiagnosed people. Considering that more than 10,000 prevalent cases were estimated in Lazio region at the end of 2008, unaware people were around 7%.

CONCLUSIONS:

These estimates suggest a substantially lower percentage of HIV+ undiagnosed persons compared to estimates based on prevalence surveys (around 25%). Differences could be due to under-reporting of simultaneous HIV/AIDS diagnoses but also to over-representation of at high-risk for HIV infection people in prevalence surveys.

PRESENTED BY: DR ALESSIA MAMMONE

Keywords: Undiagnosed-HIV, CD4-count distribution

ESCAIDE reference number: 20110179

HIV – STI

Low prevalence of HIV among drug users in Bratislava after two decades of injecting drugs

Silvia Slezakova, L. Okruhlica

AFFILIATIONS:

Centrum pre liecbu drogovych zavislosti Bratislava Hranicna 2 821 05 Bratislava Slovakia

BACKGROUND:

Epidemics of drug injecting – heroin, started in Bratislava twenty years ago. Immediately, complex preventive, harm reduction and therapeutic measures have been adopted. One of the most important tasks was to prevent the spread of HIV infection. Monitoring the situation by screening tests should provide information and feedback showing how successful were the efforts.

METHODS:

Simple descriptive statistics was applied to evaluate the situation. Voluntary screening for HIV was conducted on regular basis among the patients asking for treatment of drug dependence in the Centre for Treatment of Drug Dependence in Bratislava from January 2008 to May 2011. Calculation was separate for the occurrence of HIV-reactive cases identified by ELISA screening and HIV-positives identified by confirmatory tests: Blot 2.2 and VIROSTATIKA UNIFORM II Ag/AB-.

RESULTS:

Altogether 3,324 screening tests for HIV antibodies were conducted. 11 (0.3%) were reactive in the first stage of testing. This group consisted of 7 (64%) males and 4 (36%) females, average age 24.2 years (SD+5.6, from 16 to 32). Out of them 5 (45%) – all males were confirmed to be HIV-positive. Prevalence of HIV-positive cases was 0.15% (150/100,000) based on confirmatory testing.

CONCLUSIONS:

Monitoring of HIV infection in Bratislava after about two decades of injecting drug use is showing low, non-epidemic prevalence of the infection in the group at high risk of its contraction. The findings might be suggesting good access to harm-reduction and therapeutic programs and their proper timing in Bratislava, Slovakia. However, we should be cautious interpreting the data based on simple screening, especially in the streets. Because HIV-reactivity is remarkably higher, then the number of those confirmed as HIV-positives.

PRESENTED BY: MS SILVIA SLEZAKOVA

Keywords: HIV, drug injecting

ESCAIDE reference number: 20110223

HIV – STI

Psychosocial health problems associated with an increased HIV risk behavior among men having sex with men (MSM) in Nepal

Keshab Deuba (1), D. K. Karki (2), R. Shrestha (3), L. Bhatta (3), A. Acharya (3), U. R. Aryal (4), M. Sthapit (5)

AFFILIATIONS:

1. Department of Public Health Sciences, Karolinska Institutet Stockholm, Sweden
2. National Centre for AIDS and STD Control, Ministry of Health and Population, Kathmandu, Nepal
3. Nobel College, Pokhara University, Kathmandu, Nepal
4. Kathmandu Medical College, Kathmandu University, Kathmandu, Nepal
5. Royal Institute of Technology, Stockholm, Sweden

BACKGROUND:

A high prevalence of HIV and experience of violence and discrimination due to stigmatization of homosexual relationships has been documented among MSM in Nepal. The existing behavioral surveillance surveys and health outreach centers targeted towards this sexual minority were overwhelmingly focused on sexual risk alone. This study examined the psychosocial health problems associated with an increased HIV risk behaviors among MSM.

METHODS:

A cross-sectional survey was done among 339 MSM, 15 years and above, recruited using snow-ball sampling technique in 15 districts of Nepal between 09/2010–11/2010. The dependent variable that increased HIV risk behavior was non-use of condom for anal sex with at least one man in last three encounters. Associations between each independent variables (psychosocial health problems) and increased HIV risk behavior were calculated using the binary logistic regression.

RESULTS:

Among 339 total MSM, 118 (34.8%) experienced all forms (verbal, physical and sexual) of violence in last 12 months, 75 (22.1%) were abusing alcohol, 268 (79.1%) were experiencing depressive symptoms and 159 (46.9%) thought of committing suicide. Married vs. single (OR=1.78, 95%CI 1.04-3.03), participated in HIV prevention programs in last 12 months vs. no (OR= 0.37, 95%CI 0.14-0.98), experienced physical and sexual abuse vs. never in last 12 months (OR=3.96, 95%CI 1.12-13.98), experienced discrimination in school vs. never (OR= 1.87, 95%CI=1.11-3.16), always thought of committing suicide vs. 1 or 2 times (OR=3.03, 95%CI 1.13-8.15) and prevalence of depressive symptoms vs. normal mood (OR=1.89, 95%CI 1.12-3.18) were associated with an increased HIV risk behavior.

CONCLUSIONS:

Existing surveillance surveys and health outreach centers targeting sexual risk alone should incorporate and prioritize psychosocial health problems in their system for targeted HIV prevention interventions to be successful among MSM in Nepal.

PRESENTED BY: MR KESHAB DEUBA

Keywords: Homosexuality, Male/psychology, HIV infections/Psychology, Sexual Harassment, Suicide Attempted/Psychology, Nepal/Epidemiology

ESCAIDE reference number: 20110258

HIV – STI

Surveillance of early congenital syphilis in Spain, 2000–2010

N. Ortiz, F. Simon, M. Diez, O. Diaz, A. Diaz

AFFILIATIONS:

Centro Nacional de Epidemiología Programa de Epidemiología Aplicada De Campo (Peac) Instituto de Salud Carlos III Servicio de Dinámica de Enfermedades y Formación Aplicada. Centro Nacional de Epidemiología Área de Vigilancia VIH y Conductas De Riesgo. Centro Nacional de Epidemiología Área de Vigilancia de Las Enfermedades de Declaración Obligatoria. Centro Nacional de Epidemiología

BACKGROUND:

In the last 10 years, several countries in the European Union (EU) have reported cases of early congenital syphilis (ECS); overall reported ECS rate was 3.5/100000 live births. The true burden of the disease in the EU is unknown because it is not reportable in all countries. We aim to describe epidemiological and clinical features of ECS cases reported to the surveillance system in Spain.

METHODS:

Laboratory confirmed ECS cases reported to the Spanish Surveillance System for Communicable Diseases from 2000–2010 were included in the study. Surveillance of ECS in Spain is mandatory stillbirths are not included. Epidemiological data on cases and their mothers are collected in the surveillance forms. A descriptive data analysis was performed.

RESULTS:

A total of 67 confirmed ECS cases from 66 mothers (two cases were twins), were notified along the study period. Reported rates between 0.25/100000 and 2.23/100000 live births. There were 34 men (50.7%). Three cases (4.5%) were born outside Spain and 14 mothers (21.2%) were foreigners. Median age at diagnosis was 4 days (IQR: 1-28). An 11-days old case died. 60% of the cases were asymptomatic. Most frequent clinical findings were hepatosplenomegaly (10 cases) and skin lesions (8 cases). Data on Antenatal care was reported for 27 women: only 4 women were adequately screened and treated for syphilis, uncontrolled pregnancy was reported in 10, syphilis was diagnosed in the third trimester or at delivery in 7 and six women did not receive any treatment (or treatment was not documented).

CONCLUSIONS:

During the study period, ECS rates in Spain were lower than the overall European rates. Surveillance data for syphilis during pregnancy show missed opportunities to improve prevention of ECS in Spain.

PRESENTED BY: DR NATALIA ORTIZ

Keywords: Congenital Syphilis, Syphilis, Sexually Transmitted Infections, Pregnancy, Surveillance, Spain

ESCAIDE reference number: 20110264

POSTER SESSION ABSTRACTS

HIV – STI

Mobile population and their sexual partners as hidden high risk group of HIV infection in the republic of Georgia

Otar Chokoshvili, N. Badridze, N. Chokoshvili, T. Tsertsvadze

AFFILIATIONS:

Infectious Diseases, AIDS and Clinical Immunology Research Center, Tbilisi, Georgia

BACKGROUND:

Mobile population and illegal migrants have elevated risk of HIV. They obtain HIV in host country and transmit it to partners when return home. Study goal was to describe the role of mobile population at the HIV epidemic in Georgia.

METHODS:

We analyzed national HIV surveillance data of Georgia for 1989–2009. Variables: registration date, HIV transmission route and sub-category, probable country of HIV infection, gender, age, and HIV/AIDS stage at registration were used. Data was analyzed in Stata-v10.

RESULTS:

Data for 1630 HIV cases analyzed, median age 35 year, 1164 (71%) male. 885 (54%), 625 (38%), 43 (3%) infected through IDU, heterosexual and homosexual contacts. 1005 (62%) reported probable country of HIV infection outside Georgia, 902 (89.8%) were males, 737 (81.7%) male infected through IDU. HIV positive IDU who reports infected outside Georgia has 3.2 times more risk of HIV compared with HIV positive IDU who reports infected in Georgia (RR=3.2, 95% CI 2.8-3.7). From those 1005 infected outside Georgia, country of HIV infection was reported 688 (68%) Russian Federation and 188 (19%) Ukraine. Among those 625 (38%) who reported country of HIV infection Georgia, 363 (58%) were females, 322 (89%) females infected through heterosexual contact. From 322 female 199 (62%) reports unprotected sex with IDU or HIV positive partner, for remaining 123 (38%) sexual partners HIV or IDU status is unknown.

CONCLUSIONS:

Data analyze revealed elevated risk of HIV infection among mobile IDU population and their partners. Based on results was emphasized the important role of mobile population to spread HIV through the borders from high level HIV epidemic countries, as well as to bring new HIV cases into Georgia and spread it locally.

PRESENTED BY: MR OTAR CHOKOSHVILI

Keywords: Mobile population, HIV, IDU

ESCAIDE reference number: 20110335

INFLUENZA

Seasonal influenza vaccination coverage one year after the A(H1N1)pdm2009 influenza pandemic, France, 2010–2011

Jean-Paul Guthmann, Laure Fonteneau, Isabelle Bonmarin, Emmanuel Belchior, Daniel Lévy-Bruhl

AFFILIATIONS:

Institut de Veille Sanitaire, St Maurice, France

BACKGROUND:

The 2009–2010 vaccination campaign against A(H1N1)pdm2009 pandemic influenza resulted in a low vaccination coverage in France, partly reflecting the negative impact of controversies concerning the safety and effectiveness of the vaccine. We conducted a survey to investigate whether this apparent lack of confidence on the A(H1N1)pdm2009 vaccine may have led to a decrease in seasonal vaccination coverage the following season.

METHODS:

We conducted a one-stage random cross-sectional national telephone survey in January 2011 in mainland France using Computer Assisted Telephone Interviewing. The sampling frame was made of 70 000 random telephone numbers. We included persons belonging to one of the four target groups for influenza vaccination: 65+ years old in good health, 65+ years old with an underlying chronic disease listed in the influenza vaccine recommendations, <65 years old with such a condition, health professionals. Vaccination history since September 2010 and reasons for non vaccination were investigated.

RESULTS:

A total of 1083 persons were included. Coverage was 71% in the 65+ group with an underlying condition, 57.8% in the 65+ group in good health, 46.6% in persons aged less than 65 years old with an underlying condition and 27.6% in health professionals. These figures were not significantly lower than during the previous influenza season. Main reasons for non vaccination were being in good health (26%), fear of influenza vaccine side effects (23%), influenza vaccine considered not useful (10%). Reasons related to the pandemic were rarely cited (7.5%).

CONCLUSIONS:

Despite study limitations and although figures remain below the 75% coverage target, our results do not suggest that the controversies related to the pandemic vaccination campaign of 2009–2010 have had an impact on subsequent seasonal influenza vaccination coverage.

PRESENTED BY: MR EMMANUEL BELCHIOR

Keywords: Influenza; vaccination coverage; cross-sectional studies; France

ESCAIDE reference number: 20110053

INFLUENZA

From pandemic to post-pandemic phase, critically ill children with pandemic influenza A/H1N1 2009, Germany

Mathias Altmann (1, 2, 3), Lena Fiebig (1), Manuel Dehnert (1), Rüdiger von Kries (4), Silke Buda (1), and Walter Haas (1)

AFFILIATIONS:

1. Robert Koch-Institute, Berlin, Germany
2. Postgraduate Training for Applied Epidemiology (PAE, German FETP)
3. European Program for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
4. University of München, Munich, Germany

BACKGROUND:

The pandemic influenza A/H1N1 2009 virus caused a considerable number of severe paediatric cases and deaths in Germany in the 2009–2010 season. Yet little is known on how epidemiological features of the new virus evolved. To provide new evidence on severity of influenza A/H1N1 2009 virus infections in children in the post-pandemic phase, we compared case characteristics, chronic underlying medical conditions (known risk factors for seasonal influenza) and disease outcome over two seasons.

METHODS:

In a nationwide prospective observational study using an established network including all children's hospitals in Germany, children aged <15 years admitted to paediatric intensive care units (PICU) as well as deaths with confirmed influenza A/H1N1 2009 infection were reported using a standardized questionnaire on demographic, clinical and laboratory information over the seasons 2009–2010 and 2010–2011. Fisher's exact and Wilcoxon rank-sum tests were used to compare cases in the two seasons.

RESULTS:

With 112 influenza A/H1N1 cases in 2009–2010 and 44 in 2010–2011, the post-pandemic comprised 39% of the cases identified for pandemic season. No marked differences in risk factors were found. Sepsis were more prevalent ($p < 0.05$) in 2010–2011 (21% vs. 8%). The case-fatality ratio in PICU was similar in both seasons: 15% (95% CI 8–22) in 2009–2010 and 20% (95% CI 8–33) in 2010–2011 ($p = 0.473$). Hospital-acquired infections accounted for 11% (11/101) and 23% (8/35) of the cases with available information, in 2009–2010 and 2010–2011, respectively ($p = 0.093$), and had an overall mortality of 26% (5/19).

CONCLUSIONS:

Whereas the case number was reduced, the severity of the pandemic influenza A/H1N1 2009 virus was constant in the post-pandemic phase. The high proportions in hospital-acquired infection stress the importance of infection control in hospital settings.

PRESENTED BY: DR MATHIAS ALTMANN

Keywords: Post-pandemic, pandemic influenza A/H1N1 2009, critically ill, children

ESCAIDE reference number: 20110131

INFLUENZA

Occupational Health and Practice Management of Primary Care Practitioners during Influenza Pandemic 2009/10 in Germany

Ute Rexroth (1, 2), M. Luchtenberg (1), F. Schwarz (1), K. Köpke (1), W. Haas (1), S. Buda (1)

AFFILIATIONS:

1. Robert Koch Institute, Department for Infectious Disease Epidemiology, Berlin, Germany.
2. Postgraduate Training for Applied Epidemiology (PAE, German FETP) and European Programme for Intervention Epidemiology Training (EPIET).

BACKGROUND:

During influenza pandemic 2009/10 primary care physicians played a major role in preparedness and response. Public health authorities and professional organizations recommended physicians to change practice management for patients with acute respiratory infections (ARI), to reduce transmission and protect practice staff. In order to refine communication strategies between public authorities and physicians, this study evaluated these recommendations' implementation by physicians engaged in primary care of ARI patients.

METHODS:

In fall 2010, we sent a standardized self-administered paper-and-pencil questionnaire to physicians participating in sentinel syndrome influenza surveillance in Germany, asking for information sources, practice management, occupational safety and vaccination of staff (e.g. doctors, nurses) during 2009/10 and 2010/11 seasons.

RESULTS:

Out of 1150 physicians, 760 replied (66%). RKI web pages and links were the major source of information on epidemiology (85.7%; 651/760) and occupational health (71.6%; 544/760). Recommendations were considered reasonable by 64.2% (488/760). Overall, 67.7% (509/760) changed their practice management accordingly. Physicians separated ARI patients spatially (73.7%; 560/760) and timely (37.8%; 287/760) from others and used hand disinfection (76.1%; 578/760), gloves (62.4%; 474/760) and facial masks (51.8%; 389/760) more frequently than usual. In 72.3%, physicians were vaccinated against pandemic influenza (550/760). Vaccine safety concerns were the main reason for not being vaccinated (65.1%; 143/206). The entire staff was vaccinated against pandemic influenza in 34.6% (263/760) and seasonal influenza in 52.4% (398/760) during season 2009/10, compared to 44.6% (339/760) during season 2010/11.

CONCLUSIONS:

The majority of German primary care physicians considered recommendations on occupational safety reasonable and changed practice management during the pandemic. They separated infectious patients and used precautions to reduce transmission and increase occupational safety. However, vaccination coverage of staff was low and decreased since influenza pandemic.

PRESENTED BY: DR UTE REXROTH

Keywords: Practice management, occupational health, pandemic, influenza vaccines, evaluation studies

ESCAIDE reference number: 20110150

POSTER SESSION ABSTRACTS

INFLUENZA

Young age as an independent risk factor for severe outcome after infection with pandemic influenza A(H1N1)

Annicka Reuss, Manuel Dehnert, Silke Buda, Walter Haas

AFFILIATIONS:

Robert Koch Institute, Berlin, Germany

BACKGROUND:

Knowing the risk groups for developing severe disease after infection with pandemic influenza A(H1N1) (A(H1N1)pdm) is important to prevent morbidity and mortality. Studies in hospitalized patients have identified underlying medical conditions and older age as risk factors. We aimed to assess whether age less than two years represents an independent risk factor of pneumonia or death in cases with A(H1N1)pdm infection in Germany.

METHODS:

We analysed cases with laboratory confirmed A(H1N1)pdm infection in Germany notified between week 29/2009 and 17/2010. Data included information on demographic characteristics, underlying medical conditions (diabetes mellitus, impairment of cardiovascular or respiratory system, obesity, immunosuppression and other), pneumonia and death. We investigated the effect of age using multivariable logistic models with pneumonia and death as indicators for severe outcomes and calculating corresponding odds ratios (OR) and 95% confidence intervals (CI).

RESULTS:

Of 170,856 cases with A(H1N1)pdm infection notified during the study period (3,345 <2-year-olds), 1,412 developed pneumonia (62 <2-year-olds) and 250 died (6 <2-year-olds). The odds of severe outcomes is higher in <2-year-old children compared to cases aged 15–50 years after adjusting for underlying medical conditions and gender (for pneumonia: OR=2.86; 95%CI 2.15–3.82; $p<0.001$; for death: OR=1.36; 95%CI 0.55–3.38; $p=0.509$). In comparison, the odds for cases over 50 years were for pneumonia OR=2.85; 95%CI 2.43–3.34; $p<0.001$ and for death OR=3.37; 95%CI 2.45–4.64; $p<0.001$.

CONCLUSIONS:

Young children represent a vulnerable group for severe disease outcome after infection with A(H1N1)pdm even though this could not be shown for the risk of death. These findings stress the need to improve prevention and treatment strategies in this age group. Further research is needed to identify the mechanisms determining disease severity in young children.

PRESENTED BY: MS ANNICKA REUSS

Keywords: Influenza A Virus; H1N1 Subtype; Risk Factors; Age Groups

ESCAIDE reference number: 20110184

INFLUENZA

Influenza vaccine effectiveness in Spain during season 2010–11: results of cycEVA case-control study

S. Jiménez-Jorge (1), C. Savulescu (1,2), S. de Mateo (1), F. Pozo (3), A. Larrauri Camara (1), and the Spanish cycEVA team, on behalf of the Spanish Influenza Surveillance System

AFFILIATIONS:

1. National Centre of Epidemiology, Institute of Health Carlos III, CIBERESP, Madrid, Spain
2. EpiConcept, Paris, France
3. National Influenza Centre-Madrid, National Centre for Microbiology, Institute of Health Carlos III, Madrid, Spain

BACKGROUND:

In Spain, influenza vaccine effectiveness (IVE) has been estimated using a test-negative case-control design (cycEVA study) conducted in the frame of the Spanish Influenza Sentinel System (SISS) since the season 2008–09. In the season 2010–11, we aimed to measure the IVE against laboratory confirmed influenza like illnesses (ILI) by influenza type/subtype and in target groups for vaccination

METHODS:

Between weeks 50/2010–12/2011, we compared vaccination status of cases (ILI laboratory-confirmed as A(H1N1)2009 or B influenza) and controls (ILI negative for any-type of influenza). The analysis was conducted for all patients (all) and for those eligible for vaccination (eligible), swabbed less than eight days after symptom onset. We also studied the IVE against A(H1N1)2009 infection according to the previous pandemic vaccination. We used logistic regression to calculate adjusted odds ratios (OR) and computed IVE as $(1-OR)^{*100}$

RESULTS:

The adjusted IVE against A(H1N1)2009 infection was 51% (95% confidence interval (95%CI):3; 73). Among A(H1N1)2009 patients who only received the 2010–11 trivalent vaccine, the IVE was 53% (95%CI:8; 75) (all) and 53% (95%CI:0; 78) (eligible). In those receiving both (seasonal and pandemic vaccines), IVE was 76% (95%CI: 20; 93) (all) and 83% (95%CI:33; 96) (eligible). The adjusted IVE against B infection was 41% (95%CI:-64; 79) (all) and 25% (95%CI: -193; 81) (eligible)

CONCLUSIONS:

We observed a moderate protective effect of the trivalent 2010–11 vaccine against A(H1N1)2009, lower than reported for the monovalent pandemic vaccine last season. Vaccination with both (seasonal and pandemic) vaccines conferred a better protection. Results suggested a moderate protection effect of the trivalent 2010–11 vaccine against B infections. In its third edition, cycEVA provided more precise IVE estimates in Spain

PRESENTED BY: DR SILVIA JIMÉNEZ-JORGE

Keywords: Influenza vaccine, vaccine effectiveness, case-control study, sentinel surveillance

ESCAIDE reference number: 20110238

INFLUENZA

Effectiveness of influenza vaccination on the reduction of hospitalization risk in elderly

Josep Vaqué, Y. Cossio, J. Caro, E. Calderón, C. Barrantes

AFFILIATIONS:

Servei de Medicina Preventiva i Epidemiologia. Hospital Universitari Vall d'Hebron, Barcelona, Spain.

BACKGROUND:

The marked beneficial effect of influenza vaccination in elderly people reported in several observational studies has led to an important controversy. The aim of our study is to determine the effectiveness of influenza vaccine against hospitalizations for all diseases, and specifically for pneumonia, chronic respiratory, heart, cerebrovascular, and neoplastic diseases in individuals over 60 years of age of our Health Area.

METHODS:

Retrospective cohort of elderly individuals during the 2008–2009 influenza season assigned to the Health Area of Vall d'Hebron hospital. Demographic, medical data and vaccination status were obtained from the primary health care databases. Information on possible hospitalization over the next 3 months after the vaccination period, was retrieved from the Vall d'Hebron hospital database. We performed a logistic model adjusting by age, sex, morbidity, and number of medical visits. The study was approved by the research ethic committee of Hospital.

RESULTS:

The vaccination coverage of the cohort of 86.616 individuals was 54,8%; mean age 72,3 years (SD 8,2). The vaccinated cohort had a higher mean age ($p < 0,001$), higher proportion of women ($p < 0,001$), and higher prevalence of chronic diseases ($p < 0,001$). The risk of hospitalization for all diseases in the vaccinated was: OR crude=1,35 (IC95% 1,27-1,43), and OR adjusted=0,90 (0,84-0,96) compared to non-vaccinated. The adjusted OR for all the specific diseases was OR adj=0,91 (0,82-0,99). When considered separately, we only observed a significant protection against hospitalization for neoplastic diseases ($p < 0,001$).

CONCLUSIONS:

Vaccination reduced in 10% the hospitalization risk and in 9% for the specific disease considered. According to non-adjusted data, vaccinated patients showed higher hospitalization risk, but after adjusting for age, sex, baseline morbidity and number of annual visits we could determine a protective effect of vaccination.

PRESENTED BY: DR YOLIMA COSSIO

Keywords: Seasonal influenza vaccination, Vaccination effectiveness, Hospitalization, Old people, Chronic diseases

ESCAIDE reference number: 20110252

INFLUENZA

Pandemic influenza cases (2009) without underlying conditions – who died and why?

Flaviu Plata, R. Snacken, E. Broberg, A. Amato-Gauci

AFFILIATIONS:

Surveillance and Response Support Unit, European Centre for Disease Prevention and Control, Stockholm, Sweden

BACKGROUND:

Influenza tends to be more severe in persons with underlying medical conditions who therefore form part of the defined risk groups targeted for vaccination.

METHODS:

We conducted a descriptive analysis of 1 445 cases hospitalised with pandemic influenza that were specifically reported to have had no underlying condition. The data were submitted by nine EU Member States to the European Surveillance System (TESSy) database from week 36/2009 to week 25/2010.

RESULTS:

The median age of the 1 442 cases with known age was 13 years, with 207 cases (14%) younger than one year and 293 cases (20%) younger than 2 years; 75% of cases were younger than 35 years. The male to female ratio was 1.14. Among the 831 cases with known outcome, there were 39 (5%) fatal cases with a median age of 39 years and six fatal cases under one year of age. The median time the fatal cases spent in hospital was 5 days with a minimum of zero and a maximum of 51 days. The median duration from onset to hospitalisation was 2 days and for fatal cases ($n = 29$) five days.

CONCLUSIONS:

The majority of hospitalised influenza cases with no previously known underlying condition were young. One of the factors that might influence the outcome seems to be the length of the interval from onset of disease to hospitalisation. This study has a limitation due to the size of the sample. However continuing surveillance of hospitalised influenza cases, with support from specialized clinician networks, allows monitoring of the characteristics of previously healthy persons that end up in the hospital and even die from influenza and eventually redefine the risk groups.

PRESENTED BY: DR FLAVIU PLATA

Keywords: Influenza, SARI, surveillance, pandemic

ESCAIDE reference number: 20110253

POSTER SESSION ABSTRACTS

INFLUENZA

Influenza surveillance during season 2010–2011 in Greece

M. Athanasiou, A. Andreopoulou, G. Spala, K. Karageorgou, S. Patrinos, S. Tsiodras, S. Bonovas

AFFILIATIONS:

Hellenic Centre for Disease Control and Prevention

BACKGROUND:

Given the potential for severe influenza cases caused by A(H1N1)2009 in the post-pandemic period Greece continued surveillance of influenza cases requiring ICU admission or dying in hospital.

METHODS:

In December 2010, an enhanced surveillance system for severe influenza cases was set up. It involved direct reporting to the HCDCP of laboratory-confirmed influenza cases admitted to ICU and/or had fatal outcome. Influenza activity was also monitored through routine sentinel surveillance system. All-cause mortality was monitored through the European Mortality Monitoring project.

RESULTS:

Between week 40/2010 and 20/2011, 13,286 specimens were tested. Pandemic influenza A(H1N1)2009 was the predominant strain (97.7%). Sentinel ILI rates followed a typical seasonal pattern peaking in week 5/2011. A total of 368 laboratory-confirmed influenza cases admitted to ICU and 180 fatal cases were reported. ICU bed occupancy reached 155 at the peak of the outbreak. Median age among ICU admissions was 52 years (range: 3 months- 86 years). The majority of patients were admitted due to ARDS (250/368, 68%). Mean ICU stay was 18 days and mean ICU stay until death was 17.6 days. Data from the EuroMoMo surveillance system did not show excess all-cause mortality up to end April 2011.

CONCLUSIONS:

Community influenza activity during season 2010–11 was lower compared to the pandemic 2009–2010, but higher than in the years before that. Influenza A(H1N1)2009 was the dominant strain and shows a characteristic pattern of morbidity, which includes the propensity for clinical progression and poor outcome in relatively younger patients with pulmonary problems and obesity. This should prompt reconsideration of our seasonal influenza immunization policies.

PRESENTED BY: DR AGORITSA BAKA

Keywords: Severe influenza, surveillance

ESCAIDE reference number: 20110273

INFLUENZA

Estimates of influenza vaccine effectiveness using a sentinel practitioner network in Poland during the 2010/2011

Małgorzata Głuchowska (1), Iwona Paradowska-Stankiewicz (1), Magdalena Romanowska (2), Lidia Brydak (2), Paweł Stefanoff (1)

AFFILIATIONS:

1. National Institute of Public Health-National Institute of Hygiene, Department of Epidemiology, Warsaw, Poland
2. National Influenza Center, National Institute of Public Health-National Institute of Hygiene, Warsaw, Poland

BACKGROUND:

For the first time in 2010–11, Poland participated in I-MOVE, a network monitoring influenza vaccine effectiveness (IVE) in Europe. We conducted a case-control to estimate IVE and to provide age specific IVE and distribution of flu types by age-groups.

METHODS:

In the study period (20 weeks) 33 sentinel GPs from six regions in Poland enrolled patients with ILI/ARI symptoms adhering to the European ILI case definition, interviewed them and collected nasopharyngeal samples for laboratory testing. Cases were ILI influenza positive. The control group were influenza negative patients. The distribution of influenza types by age group was compared. Crude IVE estimates were computed, and adjusted for potential confounders (age group, sex, onset week, symptoms, smoking, chronic diseases, current and previous seasonal vaccination, number of practitioner visits in the previous year).

RESULTS:

Among 180 medically attended ILI patients, we identified 99 cases (55%). Thirty cases were positive for A(H1N1), 15 for another type A and 54 for B influenza. A(H1N1) was the dominant influenza strain in the 0–4 year olds (66.6%; 2/3). In the other groups B was the dominant strain. Among a group of 5–14 years old patients it was confirmed in 80.1% (21/26) of cases, among 15–64 years old patients and those aged 65 or over in 43.9% (29/66) and 75.0% (3/4), respectively. Based on the multivariable analysis crude IVE was 54.2% (95%CI -31-84.1) overall, 75.4 against A(H1N1) (95%CI -110.3 -97.1) and 64.3% (95%CI -21.4-89.5) against influenza B. IVE adjusted by age group was 46.8% (95% CI -59.8 – 82.3).

CONCLUSIONS:

The results suggest a moderate IVE in the Polish population during the season 2010/2011. The main limitation in this first season was the sample size.

PRESENTED BY: MISS MAŁGORZATA GŁUCHOWSKA

Keywords: Influenza, vaccine effectiveness, sentinel, case control study

ESCAIDE reference number: 20110279

INFLUENZA

Influenza-associated hospitalizations in Finland 1996–2009: unexpected age distribution during pandemic of 2009

Andreas Jacks (1, 2), J. Ollgren (2), T. Ziegler (2), O. Lyytikäinen (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. National Institute for Health and Welfare (THL), Helsinki, Finland

BACKGROUND:

Recent findings from Denmark unveiled excessive influenza-associated hospitalizations among children and young adults during the 2009–2010 pandemic; for comparison and updating public health interventions, we assessed hospital burden of influenza in Finland.

METHODS:

From the national hospital discharge registry, we extracted hospitalizations in 1996–2009 potentially related to influenza and its complications (influenza, viral and bacterial pneumonia, febrile convulsions, acute respiratory distress syndrome) using International Classification of Diseases codes. Repeated hospitalizations within 42 days for one individual were combined as one episode to calculate weekly incidence rates per 100,000 population. For non-pandemic seasons (from week 30 to week 15 of following year), age- and diagnosis-specific number of hospitalizations were compared with pandemic season using binomial regression. To predict age-specific hospitalizations in 2009, we applied a negative binomial regression model to previous seasons, also including weekly reports of influenza A, B and RS-viruses from national laboratory-based surveillance.

RESULTS:

Influenza-associated hospitalization rates were higher during pandemic compared to non-pandemic seasons (average 22582/season) for 5–24 year-olds (incidence rate ratio (IRR)=1.86; 95% confidence intervals (CI) 1.76–1.97) and 25–64 year-olds (IRR=1.40; 95%CI 1.36–1.44), but lower for persons aged ≥65 years (IRR=0.92; 95%CI 0.90–0.94). Discharge diagnoses influenza (relative risk (RR)=2.90, 95%CI 2.02–4.18), viral pneumonia (RR=1.14, 95%CI 1.05–1.24) and acute respiratory distress syndrome (RR=1.12; 95%CI 1.01–1.25) were more frequent. During pandemic, observed hospitalizations exceeded upper prediction limit by 174% in 5–24 year-olds, 65% in 0–4 year-olds and 57% in 25–64 year-olds.

CONCLUSIONS:

Influenza-associated hospitalizations in Finland during pandemic season showed unexpected hospital burden in the 5–24 year-olds as in Denmark but also among 25–64 year-olds, impact also differed by diagnostic groups. Continuous surveillance of hospitalizations will improve preparedness plans and guide immunization priorities.

PRESENTED BY: DR ANDREAS JACKS

Keywords: Influenza, Hospitalization, Age groups, Statistical model

ESCAIDE reference number: 20110284

INFLUENZA

Early experience with SARI surveillance and an assessment of the first post-pandemic 2010–2011 influenza season in the WHO European Region

Tamara Meerhoff (1), J. Mott (2), L. Martirosyan (3), P. Jorgensen (2), D. Pereyaslov (2), C. Brown (2), on behalf of the EuroFlu group*

AFFILIATIONS:

1. Radboud University Nijmegen Medical Centre, Department of Primary and Community Care, Nijmegen, the Netherlands
2. WHO Regional Office for Europe, Division of Health Security, Infectious Diseases and the Environment, Copenhagen, Denmark
3. Netherlands Institute for Health Services Research (NIVEL), Utrecht, the Netherlands *The EuroFlu member list can be found at: http://www.euroflu.org/cgi-files/wiw_members_display.cgi

BACKGROUND:

Prior to the pandemic a strong tradition of influenza-like illness (ILI) and acute respiratory infections (ARI) surveillance existed but few countries performed routine surveillance of severe respiratory disease. Collaboration with Member States performing severe acute respiratory infections (SARI) surveillance was intensified with the objective of evaluating the data and to present results in the EuroFlu Weekly Bulletin in 2010–2011. Epidemiological and virological data from SARI patients were compared to those with mild disease.

METHODS:

SARI patients were routinely monitored, tested for influenza, and reported weekly from a standard and generally stable number of hospitals. A SARI case was defined as a hospitalized patient with an acute respiratory illness that had fever ≥38°C, AND cough OR sore throat, AND shortness of breath OR difficulty breathing. Sentinel ILI/ARI surveillance monitored mild cases of influenza.

RESULTS:

SARI surveillance data were presented in the EuroFlu bulletin (n=11 countries). This represents the only publicly available standardized multi-country data on severe disease caused by influenza. Week 5/2011 was the median peak week for both SARI and ILI/ARI surveillance. 1619 SARI cases tested positive for influenza (54% A; 46% B). SARI cases were reported in all age groups, with most cases reported in young children and fewest in elderly. For the ILI/ARI surveillance (n=44 countries), a similar prevalence of A (60%) versus B (40%) viruses was seen as for SARI.

CONCLUSIONS:

Sentinel SARI surveillance is a promising system for monitoring severe respiratory disease. In order to define the characteristics of severe versus mild disease, the collection of virological data by age group and outcome data should be considered. SARI surveillance will also be used to identify risk factors and estimate the burden of influenza.

PRESENTED BY: DR TAMARA MEERHOFF

Keywords: Influenza, human; Sentinel surveillance; Epidemiology; Virology; Europe

ESCAIDE reference number: 20110287

POSTER SESSION ABSTRACTS

INFLUENZA

Type and serotype-specific seasonal influenza vaccine effectiveness using surveillance data during epidemic periods of six seasons, between 2004–2005 and 2010–2011 in Spain

C. Savulescu (1,2), S. Jiménez-Jorge (1), S. de Mateo (1), A. Larrauri (1), and the Spanish Influenza Sentinel Surveillance System (3)

AFFILIATIONS:

1. National Centre of Epidemiology, ISCIII, Madrid, Spain
2. EpiConcept, Paris, France (3)The Spanish Influenza Sentinel Surveillance System, Spain

BACKGROUND:

Sentinel physicians of the Spanish Influenza Sentinel Surveillance System (SISSS) collect basic information, take swabs and notify influenza like illnesses (ILI) to the system since 1996. We aimed to measure the seasonal influenza vaccine effectiveness (IVE) against ILI laboratory confirmed for circulating influenza strain, each season between 2004–2005 and 2010–2011.

METHODS:

During epidemic period of each season (2004–2011), we compared the vaccination status of the swabbed ILI patients laboratory-confirmed for predominant influenza strain (cases) to the ILI patients testing negative for any influenza (controls). Missing data on laboratory results or sub-typing were excluded, as well as the pandemic season. Data on age, sex, vaccination status and laboratory results were available for all seasons. We used logistic regression to calculate adjusted odds ratios (OR) for age, month of swabbing and Spanish region and their correspondent 95% confidence intervals (95%CI). IVE was computed as $(1-OR)^*100$.

RESULTS:

Influenza A(H3N2) was predominant in three seasons (2004–2005, 2006–2007, 2008–2009) and co-circulation of A(H1N1) and B was recorded in the other three seasons of the study period. Adjusted IVE for influenza A(H3N2) ranged between 22% (95%CI:-28; 52) in 2004–2005 (vaccine-circulating strain mismatch) and 58% (95%CI:16; 73) in the season 2008–2009. For influenza A(H1N1), adjusted IVE ranged between 56% (95%CI: 40; 68) in the post-pandemic season and 88% (95%CI:56; 97) in 2005–2006. The adjusted IVE against B virus ranged between 16% (95%CI:-88; 63) in 2005–2006 season (mismatch) and 53% (95%CI:25; 70) in 2010–2011.

CONCLUSIONS:

The IVE estimates were in line with the influenza strain's match between circulating and the vaccine ones. SISSS data allowed estimating IVE by circulating strain along the seasons. Bias cannot be excluded due to lack of collecting important confounding factors.

PRESENTED BY: DR CAMELIA SAVULESCU

Keywords: Influenza, vaccine effectiveness, case control

ESCAIDE reference number: 20110348

INTERNATIONAL HEALTH

Evaluation of diarrheal diseases surveillance system of district Kangra, Himachal Pradesh, India, 2007.

Gupta S N (1), Gupta N (2)

AFFILIATIONS:

1. MAE Graduate from National institute of Epidemiology, Chennai_India but presently working as Epidemiologist cum Faculty, at Regional Health and Family Welfare Training Centre, Chheeb, Kangra, Himachal Pradesh, India (Corresponding author)
2. Freelance researcher in Epidemiology, Kangra.

BACKGROUND:

In the year 2005, integrated disease surveillance project (IDSP) was launched in Himachal Pradesh to improve the information available to the health care providers on a set of high-priority diseases and risk factors. We evaluated the programme to identify strengths and constraints of the programme and recommend measures to overcome the constraints identified.

METHODS:

We identified and interviewed health personnel involved in disease surveillance, reviewed the documents and records pertaining to implementation plan/guidelines, training records and reports generated by various reporting units. We assessed the inputs, processes and outputs of the program across 12 blocks in Kangra. We calculated the proportion of blocks reporting the surveillance data, proportion of staff of various categories trained in surveillance activities, number of blocks with medical officers and proportion of laboratories strengthened.

RESULTS:

Out of 12 blocks, 1/3rd reporting units were sending irregular weekly reports but timely reports were received from 61% of blocks. There are lack of ground infrastructural facilities, funds, non involvement of private sector and lack of trained human resource. In the district, 43% percent of the medical officers, 5% of health workers and nil laboratory staff were trained against the target planned. None of the district level laboratories were strengthened from the allotted paltry funds.

CONCLUSIONS:

Since its commencement in March 2005, IDSP appears to be slow moving in the right direction with respect to regularity of reporting. We recommended (1) training of all peripheral level staff with adequate funding for basic infrastructure (2) dedicated district level surveillance officer.

PRESENTED BY: DR SURENDER GUPTA

Keywords: IDSP project, Surveillance, Public Health, Kangra

ESCAIDE reference number: 20110019

INTERNATIONAL HEALTH

Help seeking behavior of mothers of children with and without measles in Shahpur block of district Kangra, Himachal Pradesh, India, 2008.

Gupta SN (1), Gupta NaveenN (2),

AFFILIATIONS:

1. MAE-FETP Graduate from NIE, Chennai; presently Epidemiologist at Regional Health and Family Welfare Training Centre, Chheb, Kangra, Himachal Pradesh, India.
2. Freelance researcher in Epidemiology, Kangra

BACKGROUND:

Based upon two measles outbreaks in highly immunized district Kangra, we conducted a qualitative comparative study to describe the help seeking behavior of mothers of children with measles and to recommend remedial measures to prevent further outbreaks.

METHODS:

We conducted four Focus Group Discussions; two in Shahpur case block and two in Nagrota Bagwan comparative block with 20 mothers each in group. We enrolled all 69 mothers of children with measles and equal number of mothers in comparative similarly situated non measles block-matched for age and sex. We used a pre-designed pre-tested data collection semi structured qualitative questionnaire. We compared the responses from mothers of children exposed and unexposed to selected characteristics by Focus Group Discussions and in-depth interviews.

RESULTS:

80% of respondents from case block call measles as Dharassali; 95% mothers have bodily experience of measles. 68% respondents under Shahpur block attribute measles to the curse of goddess, 55% hold contagion as the cause for illness. For treatment (help) seeking behavior of mothers, 68% from case block go for faith healers followed by 12% by village elders/neighbors/friends/relatives while 59% from comparative block opt for doctors. Nutritional care is given in the form of restricted diet in case area. As follow up practices in the post recovery phase from illness, 58% respondents from Shahpur block invoke the blessings of the goddess Sheetla while 68% of mothers from Nagrota Bagwan block attend the medical clinic.

CONCLUSIONS:

Faith healing is the principal help seeking behaviour in measles in poor hills. Aggressive IEC activities should be targeted for economic and social behavioral change and improving access to health care facility through provision of mobile services.

PRESENTED BY: DR SURENDER GUPTA

Keywords: Measles, outbreaks, beliefs and barriers, help seeking behaviour.

ESCAIDE reference number: 20110021

INTERNATIONAL HEALTH

Field Study of Dengue Surveillance System, Vientiane Capital City, Lao People's Democratic Republic, July 2010

Qiaohong Liao (1,2), C. Jiraphongsa (1), P. Ounaphom (3), P. Siriarayaporn (1), A. Karnjanapiboonwong (1), V. Kitthiphong (1, 4), P. Khoodsimeuang (3), K. Lerdsaway (5), V. Pawun (1), N. Ekarakrungrung (1), Y M Aye (1), P. Smithsuwan (1)

AFFILIATIONS:

1. International Field Epidemiology Training Program-Thailand (IFETP-Thailand), Bureau of Epidemiology, Department of Disease Control, Ministry of Public Health, Thailand
2. Office for Disease Control and Emergency Response, Chinese Center for Disease Control and Prevention, Beijing, China
3. Epidemiology Unit, Vientiane Capital City Public Health Department, Lao People's Democratic Republic
4. National Centre for Laboratory and Epidemiology, Department of Hygiene and Prevention, Ministry of Health, Lao People's Democratic Republic
5. Field Epidemiology Training (FET), National Centre for Laboratory and Epidemiology, Department of Hygiene and Prevention, Ministry of Health, Lao People's Democratic Republic

BACKGROUND:

Dengue infection results in 21,000 deaths globally each year. Number of dengue patients increased sharply in Vientiane Capital City (VCC) since 2007. We studied dengue surveillance system to describe system and its attributes.

METHODS:

Qualitative and quantitative studies were conducted. Study sites included Public Health Department, one central and two district hospitals in VCC. We interviewed 29 officers and stakeholders. Sensitivity and predictive value positive (PVP) were calculated using data of dengue patients diagnosed from hospital log-books or reported during June-July of 2009, and June of 2010. Data quality and timeliness were evaluated in 2009.

RESULTS:

Dengue surveillance system in VCC is paper-based, composed of both passive and active components. Supportive policies were observed from all health authorities. Flows and methods of surveillance are simple and flexible, but no responsible staff in hospitals. Clinicians and nurses expected to receive feedback of surveillance report. In 2010, VCC provided more training and increased frequency of data collection. 357 and 402 dengue patients were found in 2009 and in 2010, respectively. Overall sensitivity was increased from 50% in 2009 to 68% in 2010, but decreased at central hospital with high-number of patients found. PVP was 100% in 2009 and 96% in 2010. Data accuracy proportion ranged from 79–97%, but date of onset was not reported. 60% and 32% of patients were reported within one-week in central and district hospitals, respectively.

CONCLUSIONS:

Despite of limited resources, VCC improved surveillance sensitivity by training and using active surveillance. However, active surveillance increased sensitivity when caseload is not high. For improvement, the surveillance system should designate surveillance staff in central hospitals; disseminate information to clinicians and nurses; and collect date of onset for each patient.

PRESENTED BY: DR QIAOHONG LIAO

Keywords: Dengue, surveillance system, Vientiane Capital City, Lao People's Democratic Republic

ESCAIDE reference number: 20110028

POSTER SESSION ABSTRACTS

INTERNATIONAL HEALTH

Evaluation of the Salmonella Surveillance System in Baku Azerbaijan, 2006–2008

Shalala Huseynova

AFFILIATIONS:

South Caucasus Field Epidemiology and Laboratory Training Program
Azerbaijan Republican Anti Plague Station

BACKGROUND:

According to the U.S. Centers for Disease Control and Prevention, 1.4 million people are infected each year with salmonella in the USA. During the 2006–2008 period, 1,333 cases of salmonella were registered in Azerbaijan, 98% were in children under 14 years. We evaluated the salmonella surveillance system to identify the reliability of existing surveillance data for salmonellosis from Baku, Azerbaijan.

METHODS:

We examined the 2006–2008 surveillance data on gastroenteritis notifications from the three children's infectious disease hospitals in Baku, and the three corresponding district Centers of Hygiene and Epidemiology (CHE) and the Republican CHE (RCHE). Assessment of the laboratory Quality system in the hospital laboratories CHE and RCHE laboratories were conducted using the CLSI questioners on 12 quality system essentials.

RESULTS:

In the 3 Baku hospitals, 1% of 8,669 suspected cases of gastroenteritis were confirmed as salmonella infections. Twelve other pathogens were confirmed in 13 % of cases including Proteus, Escherichia, Streptococcus, Staphylococcus, Pseudomonas, Citrobacter, Klebsiella, Vibrio, Hafnia and Candida species. In 86% of all suspect cases no pathogens were found and these cases were registered as gastroenteritis of unknown etiology. Analysis of the data shows that of 25,936 primary notifications, 20% were received late (> 2 days). Among these, 257 (0.99%) were notifications of salmonellosis. Laboratories were found to lack quality system. Case definition for salmonellosis was absent.

CONCLUSIONS:

Laboratory diagnosis in Baku hospitals is based on the Widal test which has low sensitivity and specificity (60%–90% range for both). Lack of good laboratory quality system may be the reason for the low detection rates. Development of case definitions for suspect and confirmed salmonellosis may also lead to higher case detection.

PRESENTED BY: DR SHALALA HUSEYNOVA

Keywords: Salmonella, Widal test, case definition, RCHE, laboratory quality system

ESCAIDE reference number: 20110034

INTERNATIONAL HEALTH

Evaluation of the Rabies Surveillance System of the Veterinary Services in Azerbaijan, 2000–2010

M. Shikhiyev, T. Rush, M. Geleishvili, E. Maes

AFFILIATIONS:

FELTP: South Caucasus

BACKGROUND:

Rabies is one of the most important zoonotic diseases; every year more than 55,000 people die from rabies worldwide. In Azerbaijan there were 216 animal rabies cases and 77 deaths in humans between 2000 and 2010.

METHODS:

Evaluation of the rabies surveillance system was performed according to the US CDC "Guidelines for Evaluating Public Health Surveillance Systems". Data of 2000–2010 from the Azerbaijan State Veterinary Services, the Republican Veterinary Laboratory (RVL) and Republican Anti-plague Station.

RESULTS:

From 2000 to 2010, 77 cases of human rabies were registered in Azerbaijan, and a total of 106902 persons bitten by an animal visited medical facilities for anti-rabies treatment. In the same period, a total of 326 animal samples were submitted to the RVL for testing and of these 216(66%) were confirmed positive for rabies, 75 (23%) were negative and 35(11%) were unsuitable for analysis due to inadequate temperatures during transport or delay in receipt of specimens. Of the positive samples, 111(52%) were from dogs, 58(27%) from cattle and the rest from other animals. No case definition for rabid animals is in use.

CONCLUSIONS:

We evaluated the attributes of the rabies surveillance system, and found the system to be useful. We however recommend creation of case definition for animal rabies in Azerbaijan based on existing WHO criteria, and improving population awareness about rabies and preventive measures such as registration and vaccination of pets. Given the rate of sample rejection at the RVL and poor specimen management, we recommend improvements in specimen collection, storage and shipment to improve diagnostic outcomes as well as the surveillance system sensitivity.

PRESENTED BY: MR MEZAHIR SHIKHIYEV

Keywords: Zoonotic, surveillance, RVL, vaccination

ESCAIDE reference number: 20110046

INTERNATIONAL HEALTH

Short and mid term effect of climatic factors on the epidemic occurrence of meningitis in a Sahelian city: a time series study

Jean-François Jusot Halima Boubacar Maïnassara Jean-Marc Collard

AFFILIATIONS:

JF Jusot & HB Maïnassara: Unit of Epidemiology, Health, Environment and Climate. Centre de Recherche Médicale et Sanitaire. JM Collard: Unit of Biology. Centre de Recherche Médicale et Sanitaire.

BACKGROUND:

Acute bacterial meningitis in the Sahel leads to high mortality and morbidity. The link between climate and meningitis described since the 60' is still not completely quantified. This study aimed at quantifying the link between climate factors and meningitis in Niamey.

METHODS:

Cases of acute bacteria meningitis were enrolled from 2003 to 2010 through the microbiological surveillance enhanced since 2002. All biological samples were analyzed by PCR. The daily count of meningitis was linked to the daily change in climate factors with a generalized additive model. Delayed and threshold effects of climate factors were taken into account.

RESULTS:

The epidemic size varied from 36 (2007) to 298 (2005) confirmed cases. Epidemics were essentially due to *Neisseria meningitidis*. Children <15 years were the most affected. Among the eight models fitted, one showed significant coefficients at delays of 8 to 16 days ($\beta = -0.3$ to -1.4), 0 to 8 ($\beta = 0.65$), and 16 to 24 days ($\beta = 0.47$) between daily change in minimal temperature and the occurrence of meningitis cases. Delay between wind speed and occurrence of meningitis cases was 20 to 30 days ($\beta = -1.1$ to -1.4). Increase in maximal relative humidity exhibited a negative short term effect ($\beta = -1.45$). Meningitis cases occurred at a maximal temperature threshold of 38°C ($\beta = 0.1$).

CONCLUSIONS:

The effects of climatic factors on occurrence of meningitis cases were quantified for the first time in Niger. The effects of minimal temperature, wind speed and relative humidity have some valuable explanations. The effect of maximal temperature requires more in-depth observation.

PRESENTED BY: DR JEAN-FRANÇOIS JUSOT**Keywords: Climate, Meningitis, Surveillance**

ESCAIDE reference number: 20110102

INTERNATIONAL HEALTH

Epidemiology of bacterial meningitis in Niger from January 2002 to June 2010 using microbiological surveillance data

Halima Boubacar Maïnassara, JM Collard, S Djibo, J Rocourt and JF Jusot

AFFILIATIONS:

Centre de Recherche Médicale et Sanitaire (CERMES), International Network of Pasteur Institutes, Niamey, Niger

BACKGROUND:

Bacterial meningitis severely burdens sub-Saharan Africa. In 2003, the WHO estimated that near 500 000 cases occurred, with about 10 000 deaths in Africa alone. Attack rates of epidemics can reach 1000 cases for 100 000 inhabitants. Therefore, the surveillance of the disease is essential. This study describes the epidemiology of bacterial meningitis in Niger from January 2002 to June 2010.

METHODS:

A retrospective study of data from the microbiological surveillance was undertaken. All collected cerebro-spinal fluids from clinical suspected cases in Niger were tested by polymerase chain reaction and/or bacteriology. Data on patients were collected using a questionnaire.

RESULTS:

The overall number of cases was 19 273. Over 80 % of the patients were less than 15 years old. The overall age mean was 9 years with a range of 0 to 93 years. *N. meningitidis*, *S. pneumoniae* and *H. influenzae* were found in 42.4 % among the total tested cases. The majority of confirmed cases were caused by *N. meningitidis* (81.6%). Except in 2006 when serogroup X was predominant, serogroup A was responsible of 75 % of meningococcal meningitis cases during the study period. *N. meningitidis* cases exhibited a seasonality in March and April and the highest number annual incidence was observed in 2009 (15.9 cases per 100,000 inhabitants). The annual incidence rates were most often raised in the south-east part of Niger. *S. pneumoniae* and *H. influenzae* were more raised in Niamey, respectively 275 and 145 cases.

CONCLUSIONS:

This study allowed knowing the characteristics of bacteria involved in meningitis, particularly the serogroups of *N. meningitidis* circulating in Niger, the age groups, the predominant period, and areas affected.

PRESENTED BY: DR BOUBACAR MAÏNASSARA HALIMA**Keywords: Bacterial meningitis, Neisseria meningitidis, Streptococcus pneumonia, Haemophilus influenzae Epidemiology, Niger**

ESCAIDE reference number: 20110125

POSTER SESSION ABSTRACTS

INTERNATIONAL HEALTH

Brucellosis Outbreak in the Cghuk village, Armenia, 2009

L. Avetisyan, T. Rush, E. Maes

AFFILIATIONS:

1. South Caucasus Field Epidemiology and Laboratory Training Program (SC/FELTP), Georgia
2. State Hygienic and Antiepidemic Inspectorate, MOH, Armenia, mobile phone: +37493536746, e-mail: avetisyan_lil@yahoo.com

BACKGROUND:

High incidence of abortion among small ruminants and cattle was registered in the Cghuk village of Armenia in February, 2009. In order to identify cases among population of the community, as well as to identify the factors and transmission routes and to develop an action plan to combat brucellosis, we conducted a case-control study.

METHODS:

Residents of the village of Cghuk were surveyed to identify persons with medical complaints and exposure to animals. A total of 376 people (cattle breeders and vets) were interviewed, of these, 223 apparently healthy individuals agreed to be tested for *Brucella* antibodies using the Wright serology method.

RESULTS:

15 out of 223 persons tested had positive serological findings; 10 had titers of 1:200 and 5 had titers of 1:100. Comparing seropositive to seronegative persons (cases and controls), nonuse of personal protective equipment (PPE) was associated with seropositivity (OR=4.6, 95%CI 4-15.4); 12/15 cases did not use PPE. Consumption of raw milk was associated with seropositivity, OR=24.8 (95%CI 4.0-165.7); 4/11 cases drank raw milk. Contact with dead animals was associated with seropositivity (OR=5.2, 95%CI 1.3-24.1); 8/15 cases had such contact. Of seropositive persons, two (13.3 %) had medical complaints and neither sought medical attention.

CONCLUSIONS:

Brucellosis in cattle, sheep and goats can lead to brucellosis outbreak in the community. Nonuse of PPE during cattle processing was probably responsible for human *Brucella* infections in Cghuk. We conducted a campaign for educating people on prevention and control of brucellosis, recommended the veterinary service to recognize brucellosis among animals and support the use of PPE particularly when anticipating contact with dead animals, and consider animal quarantine when sick animals are identified.

PRESENTED BY: DR LILIT AVETISYAN

Keywords: Brucellosis, ruminants, Wright test, prevention and control, hygiene

ESCAIDE reference number: 20110134

INTERNATIONAL HEALTH

Multilevel statistical modelling of the population-level impact of Avahan in Karnataka state, India

Pradeep Banandur(1, 2), M. Uma (1, 3), Rajaram. S (1, 3), S. Isac (3), T. Duchesne (4, 5), B. Abdous (3, 6), Ramesh. BM (3), S. Moses (7), M. Alary (3, 6)

AFFILIATIONS:

1. CHARME II project, Bangalore, India
2. Rajarajeswari Medical College and Hospital, Bangalore, India
3. Karnataka Health Promotion Trust, Bangalore, India
4. URESP, Centre de recherche du CHA universitaire de Québec, Québec, Canada
5. Département de mathématiques et statistiques, Université Laval, Québec, Canada
6. Département de médecine sociale et préventive, Université Laval, Québec, Canada
7. University of Manitoba, Winnipeg, Canada

BACKGROUND:

In 2003, the Bill & Melinda Gates Foundation initiated a focused HIV prevention program 'Avahan: India AIDS Initiative' among high-risk groups. We assessed the population-level impact of this intervention using HIV annual sentinel surveillance data collected in pregnant women attending antenatal clinics (ANC) in Karnataka state, India.

METHODS:

A multilevel logistic regression model considering individual and district level variables was developed using ANC sentinel surveillance data from 2003 to 2008 of all 27 consistent districts of Karnataka. Time was treated as discrete variable (due to lack of linear trend) and district-level random effects were considered for the intercept and time. Analysis was restricted to ANC women 15-24 years (proxy for HIV incidence). The impact of the intervention was assessed using interaction terms between district type (Avahan vs. non-Avahan) and time. Number of cases averted (15-24 years) was calculated comparing observed ANC HIV prevalence with the predicted HIV prevalence in the absence of Avahan intervention using ratio of ANC to NFHS-3 HIV prevalence as correction factor.

RESULTS:

HIV prevalence among young ANC women declined from 1.46% to 0.83% from 2003 to 2008. The impact of the intervention was significant ($p=0.046$). Overall, 44,852 cases (range 34,069-66,419) were averted in the general population of Karnataka due to Avahan during 2003-2008, with 31,016 (range 23,498-46,052) and 13,836 (range 10,571-20,367) cases averted among women and men, respectively.

CONCLUSIONS:

There seems to be an impact of Avahan in reducing the HIV epidemic at the population level in Karnataka. The estimates of number of cases averted have to be confirmed by mathematical modelling exercises being carried out.

PRESENTED BY: DR PRADEEP BANANDUR

Keywords: Avahan, HIV, Sentinel Surveillance

ESCAIDE reference number: 20110142

INTERNATIONAL HEALTH

Climate variability, infectious disease outbreaks and antibiotic resistance: a longitudinal study in Orissa, India

Krushna Chandra Sahoo (1), AJ Tamhankar (2), S Sahoo (3), CS Lundborg (1)

AFFILIATIONS:

1. Division of Global Health (IHCAR), Department of Public Health Sciences, Karolinska Institutet, Sweden
2. Indian Initiative for Management of Antibiotic Resistance (IIMAR), Department of Environmental Medicine, R.D. Gardi Medical College, Ujjain, India
3. Department of Microbiology, Kalinga Institute of Medical Sciences (KIMS), Super Religare Laboratories Limited, Kalinga hospital, Bhubaneswar, India

BACKGROUND:

Climate change, which increases disease burdens and antimicrobial resistance, which increases risk of death are considered emerging health problems of the 21st century. Globally, there is lack of information on association of climatic factors with antibiotic resistance and in India the same is true for impact of climate on infectious diseases. A study was therefore undertaken to understand the association between climatic changes and infectious disease outbreaks that occurred in a district of Orissa. Further, to understand the inter-relationship, between changes in climatic factors, occurrence of infectious diseases and development of antibiotic resistance, a study was conducted over 18 months in a tertiary hospital, to analyse the association of climatic factors with *Staphylococcus aureus* infections and its resistance to antibiotics.

METHODS:

The study utilized both retrospective (infectious diseases records and meteorological data) and prospective (actual monitoring of *Staphylococcus aureus* in skin infections and of antibiotic resistance patterns) information. Regression analysis was performed using R-statistical program.

RESULTS:

The study indicated that a gradual increase in maximum and a gradual decrease in minimum temperature had occurred over decades in the district, with increasing in minimum temperature associated with increase in occurrences of diarrhea, jaundice and, acute respiratory infection and chikungunya and decrease in relative humidity associated with increased microfilaria infections. *Staphylococcus aureus* infection had no relationship with climatic factors but there was a positive association of its resistance to gentamicin ($P=0.01671$) and, amikacin ($P=0.007819$), vancomycin ($P=0.00552$) and linezolid ($P=0.01320$) with decrease in temperature and to ciprofloxacin ($P=0.01431$) with decrease in relative humidity.

CONCLUSIONS:

Our study indicates that climate variability has a significant impact on disease outbreaks and antibiotic resistance. These results may play a role in the development of climate change action plan.

PRESENTED BY: MR KRUSHNA CHANDRA

Keywords: Climate change, communicable diseases, skin diseases, antibiotic resistance, longitudinal study

ESCAIDE reference number: 20110165

INTERNATIONAL HEALTH

Epidemiological Situation of rickettsiosis in Sonora, Mexico, 2002–2011

Daniel Márquez (1), L. Arriaga (1), R. Del Campo (1), F. Meneses (2)

AFFILIATIONS:

1. Epidemiology training program, Epidemiology General Direction, Ministry of Health, Mexico.
2. Operational direction of research in epidemiology, Epidemiology General Direction, Ministry of Health, Mexico.

BACKGROUND:

The rickettsial diseases are zoonoses that affect insect vectors, mammals and even humans. In Mexico during the years 1930 to 1950, there is knowledge of Rickettsial outbreaks in the states of Coahuila, Durango, San Luis Potosi, Sinaloa and Sonora. In Sonora state, Rickettsial is a health problem, under surveillance since 2002, with an important morbidity and mortality in population, especially in the districts located at south of the state, probably due to social backwardness, inadequate basic sanitation, poverty and low socio-cultural. The aim of this study was to characterize epidemiologically rickettsiosis in the state of Sonora from 2002 to 2011

METHODS:

We analyzed two databases, the first database from the period 2002–2008, the second database from the period 2009–2011.

RESULTS:

It had recorded 787 cases of rickettsiosis (rate of 32 per 100,000 population), of which 21% are considered undifferentiated. From 2009 to week 17 of 2011 there have been 31 deaths spread over 10 municipalities (mortality rate of 1.22 per 100,000 pop). Etchojoa district has been the most affected with 5.5 deaths per 100,000 inhabitants. The gender ratio of cases is 1.6 women per man. The largest proportion of cases by age group is 30 to 34 years (12%). Ciudad Obregon, is the town that has had the highest proportion of cases (37%) of the Sonora state.

CONCLUSIONS:

Despite the knowledge of rickettsial diseases in the state of Sonora since the mid-forties, continues to cause a significant burden of morbidity and mortality especially in the south of the entity. We need to develop operational research to fill gaps in the epidemiological knowledge that can generate information for decision-making about control measures and prevention of this disease.

PRESENTED BY: DR DANIEL MARQUEZ

Keywords: Rickettsia disease, Rickettsia morbidity, Mexico, Sonora

ESCAIDE reference number: 20110357

POSTER SESSION ABSTRACTS

MIGRATION, MASS GATHERINGS AND TRAVEL-ASSOCIATED INFECTION

Communicable diseases surveillance during mass gathering: the 6th Francophone games, Lebanon, 2009

Haddad Nadine (1), A. Saleh (1), A. Khoury (2), R. Asmar (2), J. Mokhbat (2, 3), P. Zalloua (3), R. Feghali (3), M. Bakhos (2), Z. Mansour (4), W. Ammar (1), D. Coulombier (5), A. Cox (5), N. Ghosn (1)

AFFILIATIONS:

1. Epidemiologic Surveillance Programme, Directorate of Prevention, Ministry of Public Health, Beirut, Lebanon
2. Medical committee for the 6th francophone games, National committee for the 6th francophone games, Beirut, Lebanon
3. Bacteriology laboratory, Rafik Hariri University Hospital, Beirut, Lebanon
4. World Health Organization Lebanon Office, Beirut, Lebanon
5. European Center for Disease Prevention and Control, Stockholm, Sweden

BACKGROUND:

Mass gathering increases risks for communicable diseases among tourists and local population. From September 27th to October 7th, Lebanon was hosting the 6th francophone games, with more than 3000 participants from 45 countries. Health threats detection focused on pandemic H1N1, in addition to imported and endemic diseases. The objective of mass gathering surveillance is to ensure timely detection of alerts for outbreak verification, investigation and response.

METHODS:

A risk assessment based on endemic diseases in participating countries was conducted to identify priority diseases. Multiple surveillance components were used: enhancing national system including indicator and event-based, implementing games specific surveillance, and international surveillance. The games surveillance was case-based including all medical consultations and daily zero-reporting from delegations. Guideline was developed specifying target events, case definitions, case management, forms and data flow. Specimen collection kits, personal protective equipment, stockpiles and isolation rooms were provided. Reference laboratories were identified. Timely testing was requested for pandemic influenza. Training of health staff and meetings with delegations were conducted. Data was collected and managed on daily basis. Feedback was generated through daily bulletins distributed to nationals and delegations. Technical assistance was provided by WHO and ECDC. The later has ensured international surveillance and the use of Medisys platform.

RESULTS:

305 medical consultations were recorded: 27% related to trauma-tism, and 13% to infectious diseases. 10 cases were acute respiratory infection, negative for pandemic influenza. 27 gastro-enteritis were reported, for which 6 stool cultures were negative. 7 national bulletins and 8 ECDC international bulletins were distributed.

CONCLUSIONS:

No outbreaks were detected. Pandemic H1N1 did not interfere with the games. Strengthening surveillance during games could not be achieved without preparedness, multi-disciplinary approach, and timely management and coordination.

PRESENTED BY: DR. NADA GHOSN

Keywords: Mass gathering, Surveillance, Communicable disease, H1N1

ESCAIDE reference number: 20110065

MIGRATION, MASS GATHERINGS AND TRAVEL-ASSOCIATED INFECTION

Implementation of a surveillance system in place for the 2010 Ryder Cup golf competition in Wales

Maria Keramarou (1, 2), D Rh Thomas (2), M Rh Evans (2), S Cottrel (2), S Urquhart (3), C Elliot (2), M Temple (1), R Perks (4), D Goulding (5), R Salmon (2)

AFFILIATIONS:

1. European Programme on Intervention Epidemiology Training (EPIET)
2. Communicable Disease Surveillance Centre, Public Health Wales, Cardiff, United Kingdom
3. Accident and Emergency Department, Aneurin Bevan Health Board, Wales, UK
4. Welsh Assembly Government
5. Health Emergency Planning, Welsh Assembly Government

BACKGROUND:

During October 2010, Wales hosted the 2010 Ryder Cup golf competition. 118.000 visitors were expected from all over Europe and the United States. We present the enhanced surveillance system set up by Public Health Wales in order to timely detect public health incidents connected to the Ryder Cup event.

METHODS:

We performed a Risk Assessment of the event and a gap analysis of the existing surveillance in Wales. We then designed an integrated enhanced Surveillance system using existing surveillance sources (GP consultation rates, local Health Protection Teams reports, real time syndromic surveillance, daily Accident & Emergency attendees) and newly established schemes (visits to the private on-site clinic, emergency admissions to local hospitals, media monitoring). A daily situation report was produced and distributed to those responsible for public health in the area around the Ryder Cup venue.

RESULTS:

There was no outbreak or major health event detected. Media surveillance identified influenza in a competitor in the week preceding the competition, but incidence of influenza activity remained low during and after the event. 206 (0.2%) individuals attended the on-site clinic and 35 were referred to local hospitals, mainly for minor injuries. Real time information was provided using existing sources and resources and causing minimal extra workload to data-providers.

CONCLUSIONS:

The surveillance model used was set up within limited time (2 months) and economic constrains but proved to be feasible, workable for similar future events and acceptable by the participating local health departments. Our experience suggests close collaboration with event organisers, use of existing surveillance sources and allocation of plenty of time in advance for the set up and test of the system.

PRESENTED BY: MISS MARIA KERAMAROU

Keywords: Mass gatherings, disease surveillance, emergency preparedness, special events

ESCAIDE reference number: 20110101

MIGRATION, MASS GATHERINGS AND TRAVEL-ASSOCIATED INFECTION

Survey system for an academic week in Portalegre

Andreia Costa, H. Arco, M. Arriaga, S. Roque

AFFILIATIONS:

Escola Superior de Saúde de Portalegre, Portalegre

BACKGROUND:

It is understood that the academic week it is a Mass Gathering Events, the number of students from the Polytechnic Institute of Portalegre in 2011, it is 2822 and usually the event receives academic young residents in the city who are university students in other cities, as well as friends of the students. It is considered therefore that the population participating in the academic week is exposed to the risk of consumption of addictive substances (alcohol, drugs) and risky behaviors (infectious diseases, physical trauma).

METHODS:

The aim was to monitor adverse effects in people who attend the academic week in Portalegre. The activities were the collection, analysis and processing of data daily, the record of the cases that motivate use of hospital emergency facilities, the local team from National Institute for Medical Emergencies, the firefighters, the Red Cross, the local team of Drugs and Addict Institute, consult the primary care and pharmacies, the outbreak investigation and completion of a final report. The participant population was all people who participated in the Academic Week Portalegre presenting signs/symptoms of poisoning (drugs consumption)/injuries. Data collection took place during the period 2–7 May through the registration survey.

RESULTS:

Ten cases were identified that used the emergency facility, where the main reasons were related to injuries of varying severity. The firefighters were a common resource specially because the consumption of addictive substances, with the highest prevalence of alcohol consumption, as well as the occurrence of injuries.

CONCLUSIONS:

The highest numbers of notifications are related to injuries and mostly with the consumption of alcohol, the mainly reports were from firefighters who provide on-site assistance. No outbreaks were reported.

PRESENTED BY: MRS ANDREIA COSTA

Keywords: Mass Gathering Events; Survey; Students

ESCAIDE reference number: 20110116

MIGRATION, MASS GATHERINGS AND TRAVEL-ASSOCIATED INFECTION

Health Protection Event Based Surveillance for London 2012 Olympic Games

Ettore Severi (1, 2), D. Turbitt (3), P. Crook (4)

AFFILIATIONS:

1. Health Protection Agency, South East Regional Epidemiology Unit
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm
3. Health Protection Agency, London Regional Epidemiology Unit
4. Health Protection Agency, North East and North Central London Health Protection Unit

BACKGROUND:

The London 2012 Olympic and Paralympic Games will take place between July and September 2012 in London and 10 more UK locations. For the event 17,000 athletes and 500,000 visitors are expected and 9,000,000 tickets have been sold. Such a mass gathering event may facilitate local spread of infectious diseases already present or imported into the UK by foreign visitors and any event will receive greater media scrutiny. The Health Protection Agency (HPA) is establishing a national Event Based Surveillance (EBS) to promptly identify and investigate, and report to relevant stakeholders possible health threats that may significantly impact the Games.

METHODS:

HPA staff at unit and regional level will flag on HPZone, a HPA web-based real-time public health case-management system, any infectious disease event considered a potential threat to the Olympics. Their analysis process will be based on standard criteria (severity, transmissibility) and also specific Olympic factors (geographical location, likelihood to impact the Olympics). The EBS team in London, composed by scientists and consultants, will screen the events flagged in HPZone on daily basis and perform the final risk assessment to decide which of those events need further investigation and reporting.

RESULTS:

Currently we are piloting the project reviewing retrospectively three months of events reported in HPZone. EBS will be also tested prior to the Games in order to increase its sensitivity and specificity. A review of the events reported and discarded will follow both the test and the end of the EBS activities.

CONCLUSIONS:

This builds on EBSs used for other major sporting events. The subsequent lessons learnt are expected to support the growing number of early threat detection system currently under development worldwide.

PRESENTED BY: MR ETTORE SEVERI

Keywords: Event Based Surveillance; Olympic Games; Mass gathering; Infectious Diseases; Epidemic intelligence

ESCAIDE reference number: 20110189

POSTER SESSION ABSTRACTS

MIGRATION, MASS GATHERINGS AND TRAVEL-ASSOCIATED INFECTION

Early warning system in migrant detention centres, Evros region, Greece 2011

Anoek Backx (1, 2), J. Mantero (3), E. Depoortere (3), A. Economopoulou (4)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training, European Centre for Disease Prevention and Control, Stockholm, Sweden
2. South Regional Office of the French Institute for Public Health Surveillance, Marseilles, France
3. European Centre for Disease prevention and Control, Stockholm, Sweden
4. Hellenic Centre for Disease Control and Prevention, Athens, Greece

BACKGROUND:

The number of migrants entering Greece by crossing the Evros river, the Greek-Turkish land border, has increased (spring-summer 2011) due to the recent unrest in northern Africa. An EU-funded project (March-July 2011) aims at improving the living conditions of migrants held in detention centers in the Evros area, where overcrowding and poor hygiene conditions are common. Under this project, the Hellenic Centre for Disease Control and Prevention (KEELPNO) established primary healthcare services and collected data on communicable diseases (CD). From May 2011, ECDC supported KEELPNO to set up an early warning system (EWS) to prevent CD outbreaks in the detention centers.

METHODS:

All detention centres were visited to obtain information about the setting and working procedures, through the project responsible, staff and revision of existing working documents. Literature on EWS in comparable contexts was reviewed. Syndromic case definitions were formulated for a list of prioritised diseases. Early-warning reporting forms, data entry sheets and feedback templates were designed. The final protocol was translated to Greek.

RESULTS:

Implementation of the EWS in a police-controlled context was challenging. The majority of the medical staff lacked previous experience or training for similar settings. Access of medical staff to the detention cells was denied for security reasons. Furthermore, the communication line between medical staff and referrals could not be direct. Data collection started in June 2011.

CONCLUSIONS:

In the context of migrant detention centres, the set-up of a simple and adapted EWS proved to be a difficult task, and data collection was started with a significant delay. To ensure sustainability of the system, a hand-over phase is foreseen in July.

PRESENTED BY: MS ANOEK BACKX

Keywords: Early Warning System, migrants, migrant detention centres, syndromic case definitions, Greece

ESCAIDE reference number: 20110272

MIGRATION, MASS GATHERINGS AND TRAVEL-ASSOCIATED INFECTION

Gastrointestinal disease outbreaks in cycling events: Are preventive measures being effective?

Ricardo Mexia (1, 2), Line Vold (2), Berit T. Heier (2), Karin Nygård (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Department of Infectious Disease Epidemiology, Norwegian Institute of Public Health, Oslo, Norway

BACKGROUND:

In 2009, after a mountain bike race counting around 19000 participants, an outbreak of gastrointestinal illness (GI) affected approximately 3800 participants. In 2010, the organizers recommended participants to use mudguards and spitting out first sip of the water bottle, and implemented environmental control-measures such as draining muddy areas and removing grazing animals near the track. We compared the use of control measures in 2009 and 2010 to assess their impact on the occurrence of GI.

METHODS:

A retrospective cohort study was conducted among all participants using a web-based questionnaire. Those who also participated in 2009 were asked to compare track conditions between years. A GI case was defined as a participant with self-reported diarrhea within 10 days of racing. We performed descriptive analysis and compared the data with a similar study conducted in 2009.

RESULTS:

Of 12465 replies (69% response rate), 572 matched the case definition (85% less GI cases than in 2009). Since 2009, use of mudguards increased 17.3% for front mudguards and 8.2% for rear mudguards. Spitting out the first sip increased 35.0%. Half of those 6791 who also participated in 2009 reported similar track conditions between years, 36% reported less mud on the track, 29% less mud in their face and 42% less grazing animals near the track.

CONCLUSIONS:

Though the number of race participants and weather conditions were similar in 2009 and 2010, there were less GI cases in 2010. This is probably due to both increased use of preventive measures by participants, and environmental control measures put in place by the organizers. We advise organizers of this and similar events to encourage participants to use preventive measures and to maintain environmental control measures.

PRESENTED BY: DR RICARDO MEXIA

Keywords: Disease Outbreaks, Sports, Preventive Measures

ESCAIDE reference number: 20110310

MOLECULAR EPIDEMIOLOGY, DIAGNOSTICS AND LABORATORY METHODS

Public Health Surveillance Laboratory Network in China

Weidong Zhang (1)*, Hongjie Yu (1)*, Zhongjie Li (1)*, Shengjie Lai (1), Honglong Zhang¹, Weizhong Yang²

AFFILIATIONS:

1. Office for Disease Control and Emergency Response, Chinese Center for Disease Control and Prevention, Beijing, 102206, Peoples' Republic of China
2. Chinese Center for Disease Control and Prevention, Beijing, 102206, Peoples' Republic of China *Authors contributed equally #Author for correspondence

BACKGROUND:

Despite of advances in medical research and treatments, a number of emerging and re-emerging infectious diseases threaten the public health globally. The lessons in recent years in China like SARS, HFMD, and novel H1N1 flu has made the government to step up its response and strategy development by strengthening the surveillance and response network.

METHODS:

China CDC formulates building national Public Health Surveillance Laboratory Network (PHSLN) to detect and monitor newly emerging infectious diseases and identify suspect agents effectively and timely.

RESULTS:

First, 14 well-performing laboratories were selected, representing the five geographic regions of China (North-East, North-West, Central, East, Central-South, South, and South-West). During the novel H1N1 epidemics, CCDC developed a novel H1N1 fast detection kit, distributed it to the network laboratories, and held technical training on its proper use. Network laboratories performed parallel diagnosis and validity checks and also isolated and sequenced viruses. The network laboratories diagnosed the first case of novel H1N1 in China in a timely.

CONCLUSIONS:

PHSLN has shown it can conduct surveillance, monitor and diagnose disease, thus contributing to the control of infectious diseases and other agents that could potentially threaten public health, it is resource- and time-saving and mutual beneficial between the laboratories.

PRESENTED BY: DR WEIDONG ZHANG

Keywords: Public Health Laboratory; Surveillance; Network; China

ESCAIDE reference number: 20110013

MOLECULAR EPIDEMIOLOGY, DIAGNOSTICS AND LABORATORY METHODS

Identification of Leishmania Species Isolated from Human Cutaneous Leishmaniasis in Aran and Bidgol (Esfahan province) Using RAPD-PCR technique

Abbas Doroodgar (1) – Mahdi Asmar (2) – Masoud Doroodgar (3) – Mohammad Reza Razavi (2) – Moein Doroodgar

AFFILIATIONS:

1. Department of Parasitology, School of Medicine, Kashan University of Medical Sciences, Kashan, Iran.
2. Department of Parasitology, Pasteur Institute of Iran, Tehran, Iran.
3. Beheshti University of Medical Sciences, School of Medicine, Tehran, Iran

BACKGROUND:

Cutaneous leishmaniasis has been observed as endemic in different parts of the Esfahan province (Iran) including Aran and Bidgol city. Due to high number of cases in this city and considering the importance of this disease, this study was conducted on determine the parasite species isolated from patients with cutaneous leishmaniasis in the city of Aran and Bidgol in 2006 – 2007 years.

METHODS:

This Cross-sectional study was conducted on human cutaneous leishmaniasis patients isolates referred to the health and treatment centers in the city of Aran and Bidgol. Samples were prepared from edge of the wounds of patients with cutaneous leishmaniasis and samples fixed by pure methanol and stained with Giemsa for microscopic examination. The samples of patients with cutaneous leishmaniasis that their direct smear was diagnosed as in NNN and then in RPMI-1640 mediums were cultured and after mass cultivation and DNA extraction using RAPD-PCR method and primers were amplified. PCR product bands were compared with the bands of standard Leishmania strains and marker.

RESULTS:

The results of RAPD-PCR method showed that 71.4% of human isolates were *L. major* and 28.6% were *L. tropica*. From 14 positive human isolates, 10 cases were infected in the area and had no trip to the contaminated area. 4 cases had history of travel to the known area contaminated with urban cutaneous leishmaniasis

CONCLUSIONS:

It seems like cutaneous leishmaniasis with *L. major* agent is locally transmitted in this region. This parasite is a major agent of cutaneous leishmaniasis and the disease is a rural cutaneous leishmaniasis type in this city. Also RAPD-PCR is a suitable technique to determine the species of parasite in epidemiological studies.

PRESENTED BY: MR ABBAS DOROODGAR

Keywords: Human, L. major, RAPD-PCR

ESCAIDE reference number: 20110039

POSTER SESSION ABSTRACTS

MOLECULAR EPIDEMIOLOGY, DIAGNOSTICS AND LABORATORY METHODS

Epidemiology of Hepatitis C Virus infection in Albania

Lila Shundi, B. Vila, E. Zeqiraj, A. Ahmeti, A. Vasili, A. Shehu, F. Balla, S. Bino

AFFILIATIONS:

Department of Infectious Diseases Control and Epidemiology, Institute of Public Health, Tirana-ALBANIA

BACKGROUND:

This is the first molecular epidemiology study in Albania on evaluation of the relative frequency of hepatitis C virus (HCV) genotypes and differences of HCV genotype distribution in relation to transmission mode, age, and correlation with clinical features among 215 patients belonging to three high-risk groups: 160 hepatologic patients (HP), 22 multitransfused patients with beta thalassemia major (BTMP), 33 dialysis patients (DP), during the period of time 2008–2010.

METHODS:

Plasma samples of all patients were examined for HCV-RNA (Cobas Amplicor Roche), HCV genotype (LiPA, Bayer) and HCV viral load (Cobas TaqMan Roche).

RESULTS:

Four major genotypes (1, 2, 3, 4) were identified. Genotype 1 (subtype 1b), predominated (65.6%), among all groups and patients that acquired HCV infection by blood transfusion and other parenteral exposures. Genotype 2 (subtype 2a/2c) is frequent in community acquired cases (26 %) and was more common in the HP group. Apparition of genotype 4 has been reported in the last years in Albania (5.6%). The main transmission route of HCV in Albania is through blood transfusion and other parenteral exposure to blood (DP and BTMP groups). BTMP had significantly lower serum HCV-RNA load (531.000 IU/ml) as compared to HP and DP groups (936.000–1.265.000 IU/ml). Among treated patients, those with type 2 had a 95% significantly higher response rate to interferon therapy than patients with type 1 (44%).

CONCLUSIONS:

Molecular and epidemiological analysis suggested that blood transfusion and horizontal nosocomial patient to patient transmission were the most likely explanation for the virus spread within Albanian population. HCV genotypes 1 (1b) and 2 (2a/2c) are prevalent in Albania, but the rate of infection with genotype 4 is increasing.

PRESENTED BY: DR LILA SHUNDI

Keywords: Hepacivirus, genotype, epidemiology

ESCAIDE reference number: 20110071

MOLECULAR EPIDEMIOLOGY, DIAGNOSTICS AND LABORATORY METHODS

Methicillin-resistant Staphylococcus aureus infections in Greece: spread of ST8o over nine years

Eleana Drougka (1), A. Foka (1), E. Jelastopulu (2), E. Lebessi (3), A. Doudoulakakis (3), Th. Panagea (1,4), A. Voyiatzi (4), D. Garatziotou (5), C. Gartzonika (6), S. Levidiotou (6), N. Giormezis (1), F. Kolonitsiou (1), A. Spiliopoulou (1), E. D. Anas

AFFILIATIONS:

1. Department of Microbiology, School of Medicine, University of Patras, Greece
2. Department of Public Health, School of Medicine, University of Patras, Greece
3. Department of Microbiology, P. and A. Kyriakou Children's Hospital of Athens, Greece.
4. Department of Microbiology, Pendelis Children's Hospital of Athens, Greece.
5. Department of Microbiology, Karamandaneion Children's Hospital of Patras, Greece.
6. Department of Microbiology, University Hospital of Ioannina, Greece.
7. Department of Microbiology, University Hospital of Larissa, Greece.

BACKGROUND:

Methicillin-resistant Staphylococcus aureus (MRSA) infections and especially community-associated (CA-MRSA), including superficial, deep-seated infections and pneumonia, are widespread among adults and children in Greece. CA-MRSA usually carry the genes encoding Panton-Valentine leukocidin (PVL). We have investigated and compared the distribution and clonal evolution of CA-MRSA during 2001–2009 among adults and children in Greece.

METHODS:

A total of 2008 MRSA were isolated from clinical specimens of patients from January 2001 till December 2009 from three tertiary teaching and three paediatric hospitals in Greece. Isolates were identified by conventional tests, followed by the determination of MIC of oxacillin by the Etest (AB Biodisk) and their antibiotic resistance patterns to antistaphylococcal agents by the disk diffusion method. The genes: *mecA* (encoding PBP2a), *lukS* and *lukF* (encoding PVL) were defined by PCRs. Clones were determined by PFGE of chromosomal DNA *Sma*I digests and MLST. CA-MRSA were isolated from patients without any predisposing risk factors.

RESULTS:

The majority of MRSA were recovered from adults (66%) and male patients (57%). Increasing incidence of CA-MRSA was observed, reaching in total 84%. Genes encoding PVL were detected in 1650 strains, belonging to ST8o (1598), ST377 (33) while clones ST8, ST3o, ST72, ST121, ST225, ST239, ST461 and ST77o included 1–7 PVL-positives each. The frequency of ST8o increased from 32.7% in 2001 to 82.5% in 2009. Multi-resistant MRSA were identified among adults, while 10.3% of MRSA showed oxacillin MIC lower than 4g/L.

CONCLUSIONS:

PVL-positive MRSA belonging mainly to ST8o and ST377 clones show an increasing tendency during the last decade in Greece. Most of the cases are community-associated, reinforcing the aspect of an epidemic that needs application of infection control measures.

PRESENTED BY: MRS ELEANNA DROUGKA

Keywords: Staphylococcus aureus, MRSA, community-associated infections, infection control, Greece

ESCAIDE reference number: 20110106

MOLECULAR EPIDEMIOLOGY, DIAGNOSTICS AND LABORATORY METHODS

Seroepidemiology of viral hepatitis and HIV infection among the professional dental clinic personnel in Tehran, I.R. of Iran

Karimi Zarchi Ali Akbar (1), P Shahrudi (1), Gh Ghorbani (2)

AFFILIATIONS:

1. Baqiyatallah(a.s) university of medical sciences, Faculty of Health, Department of Epidemiology and Biostatistics. Tehran, I.R. of Iran. Email: alikarimi_in@yahoo.com
2. Baqiyatallah of Gastroenterology and Liver Disease Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran.

BACKGROUND:

Viral hepatitis and HIV infections are key public health threats that pose an enormous risk for disease transmission in the general population especially in high risk group. The aim of this study was determining the prevalence of serologic markers of HBV, HCV and HIV among the professional dental clinic personnel and assessed variations across some related factors in Tehran, I.R. of Iran

METHODS:

A seroepidemiologic cross sectional study was employed. Participants completed a face-to-face interview, a self-administered questionnaire and provided blood specimens for antibody testing. Spearman rank correlation coefficient was used to evaluate linear relationships between HBS Ab with age, doses of vaccination and duration after vaccination. Logistic regression models were used to calculate odds ratios (Ors) and 95% confidence intervals (CIs) for all independent variables.

RESULTS:

A total of 179 adults participated in the study. Seroprevalence was estimated for protective HBS Ab (90.5%), HBC Ab (2.8%), HBS Ag (0.6%), HCV Ab (0.0%) and for HIV Ab_{1/2} (0.0%) respectively. Spearman's rank coefficient showed duration after vaccination ($r = -0.11$) were noted to be correlated with HBS Ab ($P < 0.014$) and not correlated with age ($r = -0.06$) and doses of vaccination ($r = 0.19$) respectively ($P > 0.05$). Logistic regression showed demographic characteristics of participants to be independently associated with odds of having protective HBS Ab ($P > 0.05$).

CONCLUSIONS:

The majority of personnel have protective Ab against HBV, the minority has HBS Ag and none of them have HIV Ab. Integration of HCV and HBV counseling into HIV existing prevention services might represent a valuable approach to reach high-risk individuals

PRESENTED BY: DR ALI AKBAR KARIMI ZARCHI

Keywords: Seroepidemiology, Viral hepatitis, HIV infection, Dentistry

ESCAIDE reference number: 20110107

MOLECULAR EPIDEMIOLOGY, DIAGNOSTICS AND LABORATORY METHODS

A novel application for surveillance and outbreak investigations: Pyrosequencing of the hypervariable P2 domain in Norovirus

Katherina Zakikhany (1,2), David J. Allen (1), Miren Iturriza-Gómara (1)

AFFILIATIONS:

1. Health Protection Agency, Enteric Virus Unit (EVU), London, UK,
2. The European Programme for Public Health Microbiology training (EUPHEM), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

BACKGROUND:

Noroviruses (Nov) are a major cause for acute viral gastroenteritis and are responsible for large outbreaks worldwide. NoVs are a genetically highly diverse group and the relationship between genotypes, phenotypes and antigenic properties are poorly understood. Two hotspots of mutations (A and B) of the major capsid protein (VP1) have been identified as potential antigenic epitopes. Amino acid substitutions in this region were associated with the emergence of new variants responsible for epidemic waves and could be used to model the evolution of the viruses. The aim of this study is to develop a rapid and high-throughput pyrosequencing application specifically targeting the A and B site, as a tool for monitoring the evolution of NoV.

METHODS:

Primers amplifying the A and B site (P2 domain) of NoV GII-4 strains were designed. The pyrosequencing-assay was validated using NoV outbreak strains (50) from the EVU referral strain collection (2006–2011).

RESULTS:

Our rapid pyrosequencing assay, targeting the highly variable A and B site, was successfully piloted and previous results, using traditional, time-consuming Sanger sequencing (≥ 3 days), were confirmed with a reduced turnaround time (1 day). Further steps will include a comprehensive and high-throughput sequencing approach of past (2006 onwards) and current (2011 onwards) outbreak strains to assess Nov evolution and monitor current trends in a timely manner.

CONCLUSIONS:

Homology modelling showed that strains, although diverse at nucleotide and amino acid level, were antigenically equal until changes at the A and B site occurred which coincided with new epidemic waves. Together with homology modelling, our rapid pyrosequencing application is a powerful tool to monitor and detect alterations of antigenic properties of NoV in order to foresee and contain new epidemic waves.

PRESENTED BY: DR KATHERINA ZAKIKHANY

Keywords: Norovirus , pyrosequencing, P2 domain, enhanced surveillance

ESCAIDE reference number: 20110133

POSTER SESSION ABSTRACTS

MOLECULAR EPIDEMIOLOGY, DIAGNOSTICS AND LABORATORY METHODS

The changing profile of *Salmonella* serovars in England & Wales

Alison Waldram (1), T. Inns (1), D. Wilson (2), C. Lane (3), R. Gorton (1)

AFFILIATIONS:

1. North East Regional Epidemiology Unit, Health Protection Agency, UK
2. North East Health Protection Unit, Health Protection Agency, UK
3. Gastrointestinal, Emerging and Zoonotic Infections Department (GEZI), HPS – Colindale, Health Protection Agency, UK

BACKGROUND:

In England & Wales, *Salmonella* Enteritidis has been the most common serovar since typing began. In recent years, the number of *S. Enteritidis* cases has fallen dramatically. This trend, coupled with a gradual increase of *S. Typhimurium* cases, indicates that *S. Typhimurium* will become the most frequent serovar in the near future. This is already the case for several countries in the European Union e.g. Italy. This research examines the descriptive epidemiology of cases in England & Wales and attempts to predict when the crossover will occur using regression modelling.

METHODS:

Data were extracted from LabBase, a national system containing all *Salmonella* positive results from laboratories in England & Wales. Descriptive epidemiology was completed for cases by serovar using an eleven year total, 2000–2010; trends were also examined for each year individually. Student's t-test and Chi squared test were used to assess any differences between years and serovars. To predict future totals, regression models were created in Stata.

RESULTS:

There was a statistical difference ($P > 0.0001$) between the mean age of *S. Enteritidis* cases, 33.52 years, compared to *S. Typhimurium* cases, 30.91 years. There was a decreasing trend in the number of *S. Enteritidis* cases per year from 2000 to 2010 ($P > 0.001$, $R_2 = 0.84$). *S. Typhimurium* showed an increasing trend from 2005 to 2010 ($P > 0.001$, $R_2 = 0.81$).

CONCLUSIONS:

This research predicts that *S. Typhimurium* will become the most common serovar by 2012. This finding indicates that *Salmonella* control programmes in poultry populations have succeeded in reducing the burden of *S. Enteritidis* illness. To address the growing challenge of *S. Typhimurium* infection, further investigation into potential causes is required, as well as exploring new and effective control measures.

PRESENTED BY: DR ALISON WALDRAM

Keywords: *Salmonella*/epidemiology, *Salmonella*/classification, Surveillance

ESCAIDE reference number: 20110227

MOLECULAR EPIDEMIOLOGY, DIAGNOSTICS AND LABORATORY METHODS

Hepatitis C RNA PCR Retesting Exercise at the Health Protection Agency Laboratory, South West England

Petra Matulkova (1, 2), Isabel Oliver (1), David Carrington (3), Peter Muir3, Bharat Pankhania1

AFFILIATIONS:

1. Health Protection Agency (HPA), South West, Gloucester, United Kingdom
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
3. Health Protection Agency (HPA), South West Regional Laboratory, Bristol, United Kingdom

BACKGROUND:

A PCR test is used as part of a care pathway to identify active hepatitis C infection and may influence patient referral for antiviral treatment. The Health Protection Agency Laboratory in Bristol identified an inhibition problem with its in-house PCR HCV RNA assay, resulting in false negatives. Consequently, a cohort of patients previously tested HCV PRC negative were offered retesting with a commercial assay to ensure that any false negative individuals would benefit from a correct diagnosis, appropriate referral and treatment.

METHODS:

The retest cohort included 689 patients testing HCV PCR negative from 01/01/2009 to 06/05/2010. Clinicians were invited to send samples for retesting. To monitor the outcome of this exercise, they were asked to provide demographic, clinical and risk factor information on their patients, and where relevant, to state reasons for not retesting.

RESULTS:

To date 174 patients have been retested. Eighteen patients were HCV viral load positive. In 10 of these clinical history suggested possible relapses. Eight were identified as false negatives who had not been offered specialist referral. Clinicians returned 288 request forms without a sample. Reasons stated for not retesting included 'not my patient' (n= 76, further attempts were made to trace these patients), 'patient did not attend' (n= 69) and 'deceased' (n= 28).

CONCLUSIONS:

To date, eight identified false negatives have received appropriate care arrangements.. Although injecting drug use was the most commonly reported risk factor, the proportion of intravenous drug users was underreported due to lower compliance and response. The performance comparison between the enhanced in-house PCR assay and the commercial assay was considered adequate. High cohort mortality was identified and is being investigated. Benefits and lessons learnt will be presented.

PRESENTED BY: DR PETRA MATULKOVA

Keywords: Retesting exercise, Hepatitis C, HCV-RNA PRC test, Follow-up of Hepatitis C

ESCAIDE reference number: 20110285

MOLECULAR EPIDEMIOLOGY, DIAGNOSTICS AND LABORATORY METHODS

Capacity for routine laboratory diagnosis of enteric pathogens in Italy

Caterina Graziani (1), L. Mughini Gras (1), I. Luzzi (1), A. Ricci (2), L. Busani (1) and Enter-net study group participants

AFFILIATIONS:

1. Istituto Superiore di Sanità, Rome, Italy
2. Istituto Zooprofilattico delle Venezie, Legnaro, Italy

BACKGROUND:

Control of acute infectious gastroenteritis (AIG) requires information on its aetiology. Low routine laboratory diagnostic capacity limits identification of enteropathogens. This survey presents an analysis of procedures routinely adopted in investigating enteric pathogens by some laboratories of the Enteric Pathogen Network (ENTER-NET) in Italy.

METHODS:

Information regarding routine laboratory diagnostic procedures in cases of AIG (01/01/2010–31/12/2010) was collected by submitting a standardized questionnaire to a randomly selected sample of 36 out of 304 ENTER-NET laboratories in Italy.

RESULTS:

Laboratories usually receive >50%, 10–50% and <10% specimens from non-hospitalized, hospitalized and long-term care patients, respectively. Salmonella, Shigella and Campylobacter are the most routinely investigated bacteria (89%, 86% and 69% of laboratories, respectively). These three bacteria are investigated by both direct antigen/toxin detection (6%, 3%, 11%, respectively), direct microscopy (3%, 3%, 6%), and cultural assays (100%, 89%, 97%). Salmonella serotyping, Shigella and Campylobacter species identification are routinely performed by 58%, 81% and 75% laboratories, respectively. Rotavirus is the most routinely investigated virus (19%), using antigen detection (86%). Viral genome sequencing is routinely performed by 3% laboratories. Giardia and Entamoeba histolytica are the most routinely investigated protozoa (50% and 36%, respectively) using both direct antigen detection (42%, 28%) and microscopy (80%, 86%), with no further molecular characterization. No laboratory routinely investigates Bacillus cereus, Staphylococcus aureus, Clostridium difficile and non-enteroaggregative Escherichia coli, but they are investigated only if requested/suspected. Other pathogens are routinely investigated by few laboratories using mostly cultural assays with little further characterization.

CONCLUSIONS:

The observed heterogeneity in laboratory capacity and the limited range of pathogens routinely tested can affect AIG aetiological diagnosis and ultimately notification of enteropathogens to surveillance systems. Development of criteria/guidelines for harmonizing AIG diagnosis is therefore necessary.

PRESENTED BY: DR CATERINA GRAZIANI

Keywords: Infectious gastrointestinal illness, enteric pathogens, diagnostic

ESCAIDE reference number: 20110314

MOLECULAR EPIDEMIOLOGY, DIAGNOSTICS AND LABORATORY METHODS

Increasing trend in non-B subtypes among Italians newly diagnosed with HIV in Rome, 2004–2009

Assunta Navarra (1), Nicoletta Orchi (1), Antonio Palummieri (1), Caterina Gori (1), Paola Scognamiglio (1), Massimo Giuliani (2), Stefano Aviani Barbacci (3), Susanna Grisetti (1), Alessandro Sampaolesi (1), Enrico Girardi (1) on behalf of SENDIH Group

AFFILIATIONS:

1. National Institute for Infectious Diseases “L. Spallanzani”, Rome, Italy.
2. AIDS Unit. San Gallicano Hospital 3. CRAIDS Ospedale Bel colle Viterbo

BACKGROUND:

An increase in the circulation of HIV-1 non-B strains in Western European countries has been observed, with important implications for the control of HIV-1. Our aim is to describe the prevalence and the characteristics of non-B virus in individuals newly diagnosed with HIV in Lazio Region.

METHODS:

Since January 2004, a cross sectional multi-centre study, involving 14 public testing sites, has been enrolling all adults newly diagnosed with HIV. At diagnosis, demographic, epidemiological, clinical and laboratory data are collected. HIV-1 pol gene sequences were analyzed using the REGA HIV-1 Subtyping Tool. Multinomial logistic regression model was applied to understand factors independently associated with the presence of non-B strains.

RESULTS:

HIV-1 subtypes were available for 1468 individuals newly diagnosed between 2004 and 2009. Out of 1099 native Italians, 159 (14.5%) were infected with non-B subtypes. Among these, 79 were identified as Circulating Recombinants Forms – CRF, 36 as F, 14 as G, 12 as C, 8 as A, 10 as other. In native Italians non-B subtypes increased from 6.1% in 2004 to 21.3% in 2009 ($p < 0.001$). Multiple logistic regression analysis showed that acquisition of non-B HIV-1 infection was independently associated with later year of HIV diagnosis ($p = 0.009$). In addition, compared with men having sex with men, heterosexuals (but not intravenous drug users) were more likely to be infected with non-B HIV subtypes ($p = 0.001$). No significant association was founded by gender, age at diagnosis, presence of mutations conferring drug resistance and being recently infected.

CONCLUSIONS:

In Italy HIV epidemic has been evolving and non-B subtypes are rapidly spreading, mostly in heterosexuals. This fact may have major effects on controlling HIV-1, making surveillance of HIV strains increasingly important.

PRESENTED BY: DR NICOLETTA ORCHI

Keywords: Newly diagnosed HIV infection, non-B HIV-1 subtype

ESCAIDE reference number: 20110333

POSTER SESSION ABSTRACTS

MOLECULAR EPIDEMIOLOGY, DIAGNOSTICS AND LABORATORY METHODS

Molecular investigation of enteroaggregative, Shiga toxin – producing *E. coli* O104:H4 isolated in Poland during the recent international outbreak

Aleksandra Januszkiewicz, Jolanta Szych, Tomasz Wołkiewicz, Anna Chróst, Waldemar Rastawicki

AFFILIATIONS:

Department of Bacteriology, National Institute of Public Health – National Institute of Hygiene, Warsaw, Poland

BACKGROUND:

Since early May 2011 a large food-borne outbreak caused by *E. coli* O104:H4 affected Germany then spread over 13 European countries. The outbreak strain was found to possess an unusual combination of enteroaggregative *E. coli* pathotype with StxII. In this report we described three *E. coli* O104:H4 isolates associated with the outbreak in Germany.

METHODS:

Tested isolates were derived from stool samples from young women returned from northern Germany and developed HUS, boy with HUS and from his nanny with bloody diarrhea. Two weeks before the boy developed HUS his father returned from northern Germany and was diarrheic. Serotype and specific virulence determinants were performed by PCR, sequencing and Microarray methods. Etest strip were used to determine antimicrobials susceptibility. To determine the clonality of strains PFGE using XbaI and BlnI and plasmids analysis were performed. Specific anti-O104 antibodies in patient's sera were detected by ELISA.

RESULTS:

The Polish isolates were confirmed as *E. coli* O104:H4, carrying stx2a variant. They were positive for aggR, aggA, aap, sigA, sepA, pic, aatA and negative for the eae and ehly determinants. They were resistant to ampicillin, amoxicillin and clavulanic acid, cefotaxime, ceftazidime, streptomycin, nalidixic acid, tetracycline and cotrimoxazole. The isolates were found to carry blaCTX-M-15. Polish isolates related to the German outbreak strains had undistinguished PFGE-XbaI and PFGE-BlnI patterns. The high levels of specific IgA, IgG and IgM antibodies to O104 LPS were diagnosed in 3 patients and in the boy's father sera.

CONCLUSIONS:

The molecular characteristics of the Polish *E. coli* O104:H4 isolates were corresponded with Germany outbreak strains. Infections caused by two of three Polish *E. coli* O104:H4 isolates were the result of the secondary transmission within the household.

PRESENTED BY: MRS ALEKSANDRA JANUSZKIEWICZ

Keywords: *E. coli* O104:H4, verotoxic *E. coli*, outbreak

ESCAIDE reference number: 20110337

MOLECULAR EPIDEMIOLOGY, DIAGNOSTICS AND LABORATORY METHODS

Molecular surveillance of measles in the WHO European Region

Mick N. Mulders; David A. Featherstone; Dragan Jankovic; Eugene V. Gavrilin; Galina Y. Lipskaya; Claude P. Muller; Annette Mankertz; Nina T. Tikhonova; Kevin Brown; Rebecca M. Martin

AFFILIATIONS:

World Health Organization – Regional Office for Europe World Health Organization – Headquarters Moscow State University Institute of Immunology, Luxembourg Robert Koch Institute, Berlin Gabrichevsky Institute Moscow Health Protection Agency, London

BACKGROUND:

The European Region of the World Health Organization (WHO/Europe) has renewed its commitment to the regional elimination of measles and rubella by 2015. Maintaining high vaccination coverage (>95%) with two doses, high quality case-based surveillance, sharing information and advocating for immunization will all play a critical role in achieving this goal. Disease surveillance, in particular, is vital to monitor the progress towards elimination. Case-based surveillance should capture epidemiological data, vaccination status, and laboratory results to confirm clinical diagnosis and provide evidence regarding the interruption of indigenous transmission of measles viruses.

METHODS:

Molecular-based techniques for identifying measles and rubella viruses are an integral component of case-based surveillance. Such techniques allow Member States and WHO/Europe to identify virus transmission pathways, monitor the effectiveness of control activities, identify reservoirs sustaining virus transmission and provide evidence that elimination has been achieved.

RESULTS:

The use of molecular surveillance has demonstrated its usefulness in defining transmission pathways during recent outbreaks in the European Region, including the large outbreaks in Bulgaria in 2009–2010 with transmission to other Member States, and in France in 2011 with evidence of transmission of genotype D4 to Belgium, Spain, Switzerland, United Kingdom, and Brazil. Genotyping of measles virus in Turkey in early 2011, determined D9 had been imported from southeast Asia. Interestingly, during a 2-month period in 2010, a previously unrecognized genotype G3 was introduced in Europe.

CONCLUSIONS:

Molecular surveillance will continue to play an important role in understanding transmission of measles and rubella viruses and in verifying interruption of indigenous viruses required for documenting measles and rubella elimination.

PRESENTED BY: DR MICK MULDER

Keywords: Measles elimination WHO molecular epidemiology

ESCAIDE reference number: 20110338

OUTBREAKS

Multiple linked care service providers implicated in large scabies outbreak affecting the elderly and mentally disabled in Tilburg, the Netherlands

Georgia Ladbury (1, 2), G. Morroy (3), S. van Hoeven-Dekkers (3), K. Veelenturf (4), M. Bastiaens (5), C. van Abeelen (5), C. Botermans (5), C. Wijkmans (3)

AFFILIATIONS:

1. Centre for Infectious Disease Control, National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
3. Hart voor Brabant Municipal Health Service, The Netherlands
4. De Wever Stichting, Tilburg, The Netherlands
5. TweeSteden Hospital, Tilburg, The Netherlands

BACKGROUND:

Scabies is a debilitating skin infestation difficult to control in institutional settings. In 2010, a large outbreak occurred in Tilburg, south Netherlands, affecting the elderly and mentally disabled and their carers. Healthcare for these people involves many care service providers, with frequent transfer of patients and personnel between institutions, agencies and the community. Our investigation aimed to determine the extent of the outbreak with regards case numbers, care providers affected, and contacts traced and treated.

METHODS:

We reviewed case management reports from the municipal health service to determine the healthcare providers implicated. Cases were defined as patients with clinical symptoms consistent with scabies between 28 October 2010 and 31 January 2011 and links to a Tilburg care provider. We collated information from care providers on contact tracing and on the collection of care providers which each case used or worked for.

RESULTS:

Twenty six cases were identified linked to six care homes, one hospital, one community home care service; one general care service for the mentally disabled; and one travel foundation for the mentally disabled. Nine cases were among carers or carers' families. Of the 26 cases, 20 (77%) were identified through contact tracing. Over 1600 contacts were treated prophylactically. The cases were highly interlinked, with 12/26 (46%) associated with more than one case or care provider.

CONCLUSIONS:

Frequent transfer of clients and personnel between healthcare providers and the community can facilitate scabies transmission. Detailed contact tracing is essential to identify cases. Medical practitioners and public health professionals should always consider the different patient settings in case of scabies diagnosis. This will facilitate timely identification of other potentially affected care service providers and limit the opportunity for further transmission.

PRESENTED BY: MISS GEORGIA LADBURY

Keywords: Scabies, residential facilities, home care services, aged, mentally disabled persons

ESCAIDE reference number: 20110012

OUTBREAKS

A Norovirus Outbreak in a High Quality Hotel in Oslo Reveals Several Irregularities in the Kitchen's Hygiene

Bernardo Guzman-Herrador (1, 2), BT. Heier (1), EJ. Osborg (3), VH. Nguyen (3), L. Vold (1)

AFFILIATIONS:

1. Norwegian Institute of Public Health, Oslo, Norway
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
3. Norwegian Food Safety Authority, Oslo, Norway

BACKGROUND:

The Norwegian Institute of Public Health (NIPH) and the Norwegian Food Safety Authority (NFSA) were informed about a high number of gastroenteritis cases among attendants of a meeting January 28 in a high-quality hotel in Oslo. We conducted an outbreak investigation to determine the pathogen, source and transmission route.

METHODS:

NIPH conducted a retrospective cohort study among all attendants. A case was defined as a meeting attendant who developed diarrhoea and/or vomiting within the next three days. Through a web-based questionnaire we gathered information on demographics, symptoms and food exposures from the fixed menu and encouraged sick people to have a stool sample taken. NFSA performed an inspection in the hotel's kitchen.

RESULTS:

A total of 391/880 (44%) attendants answered the questionnaire and 56 (14.4%) matched the case definition. Nobody required hospitalization. 76.8% of cases became ill within 48 hours after the meeting. We could not identify an association between a specific food-item and disease as most attendants ate the same food. All 3/3 stool samples were norovirus positive. None of the kitchen employees reported gastrointestinal symptoms. NFSA observed an inadequate cooling of heat-treated foods, unprotected dishes during storage, only one operative hand washing point and insufficient disinfection of work surfaces and dishes.

CONCLUSIONS:

The source and transmission route of this norovirus outbreak remains unclear: the epidemiological analysis of the food eaten was inconclusive and the role of the kitchen employees or participants uncertain. However the investigation highlighted irregularities in the kitchen that may have enabled the spread of the virus. Specific cleaning procedures and rules were launched to the kitchen staff. The NFSA followed up to ensure that all the irregularities were addressed within the deadline proposed.

PRESENTED BY: MR BERNARDO GUZMÁN-HERRADOR

Keywords: Norovirus, gastroenteritis, outbreak, hotel

ESCAIDE reference number: 20110035

POSTER SESSION ABSTRACTS

OUTBREAKS

Waterborne Gastroenteritis' Outbreak – Becharreh district, Lebanon, Summer 2010

Dahlia Saab (1), N. Ghosn (1), M. Chaaya (2) and A. Tawk (3)

AFFILIATIONS:

1. Epidemiological Surveillance Program, Directory of Prevention, Ministry of Public Health, Beirut, Lebanon.
2. Department of Epidemiology and Population Health, Faculty of Health Sciences, American University of Beirut, Beirut, Lebanon.
3. Becharreh Public Health service, Ministry of Public Health, Lebanon.

BACKGROUND:

Gastroenteritis remains a major threat in Lebanon. In August 2010, physicians in Becharreh Public Hospital reported to the Ministry of Public Health an increase of gastroenteritis patients. This alert led to an epidemiological investigation to describe cases, confirm the outbreak, and identify risk factors associated with developing symptoms.

METHODS:

Emergency departments [ED] records for the last 2 years were reviewed. A matched case-control study was conducted. Cases were most recent patients in household with gastroenteritis presenting to ED between 1 and 19 August 2010. Controls were selected by random digit dialing from houses with no gastroenteritis from the same district and were matched by age and gender. Phone interviews were conducted using a structured questionnaire including socio-demographic information, symptoms and potential risk factors related to water, food and hygiene. Water and stool samples were collected for bacteriological culture. EpiData3.1 and STATA10.0 were used for data entry and analysis.

RESULTS:

268 gastroenteritis ED records were reported in 2010, compared to 43 for the same period in 2009 representing a significant increase ($p < 0.001$). 117 patients were interviewed and 101 cases were matched to controls. Of the 117, 66 (56.4%) were from the village of Becharreh, 82 (70.1%) were females and 89 (82.4%) had watery diarrhoea. All ages were affected. Bivariate analysis showed significant association with drinking water and 3 other variables. Multivariate logistic regression revealed that eating/drinking in Becharreh village and drinking from the water network were risk factors (respective ORs: 10.61 [95%CI: 3.81-29.54], 2.91 [95%CI: 1.21-6.96]). Water had fecal contamination. 25 of 30 available stool cultures were negative.

CONCLUSIONS:

Drinking from the network in Becharreh village was the main risk factor. Network water pipes were fixed. Water monitoring is crucial for preventing future outbreaks.

PRESENTED BY: DR NADA GHOSN

Keywords: Gastroenteritis, outbreak, water, case-control study

ESCAIDE reference number: 20110040

OUTBREAKS

A waterborne gastroenteritis outbreak associated with a contaminated water supply in Belgium, December 2010

Toon Braeye (1), Koen De Schrijver (2)

AFFILIATIONS:

1. Scientific Institute of Public Health, Brussels, Belgium
2. Department of Infectious Disease Control, Antwerp, Belgium.
Department of Epidemiology and Social Medicine University of Antwerp

BACKGROUND:

On 9 December 2010, Infectious Disease Control of Antwerp was notified of a bacterial contamination of the water supply in two villages, Hemiksem and Schelle (N=18,000). Previously river water and tap water were used during local firefighting activities. From 6 December on an increase in gastroenteritis was reported. We investigated the source and impact of the outbreak.

METHODS:

We conducted a retrospective cohort study among 1000 randomly selected families from Hemiksem and Schelle. A postal survey was used to gather information on an individual level about the use of tap water and the presence of symptoms during December. Active case finding was done by contacting GP's. Stool samples and water samples were tested for pathogens. A case was defined as anyone reporting diarrhoea and/or vomiting with an onset between 6–13 December.

RESULTS:

The postal survey had a response rate of 52.8%. Out of 1185 responding individuals 224 (18.9%) were identified as cases. Residents drinking tap water had an increased risk for gastroenteritis (RR=3.31; 95% CI 2.6-4.3). With every glass a person drank the risk became 1.2 (95% CI 1.16-1.26) times higher. GP's reported 603 additional cases of gastrointestinal disease between 6–13 December. *Campylobacter* sp. (N=2/79), Norovirus GI and GII (N=22/79), adenovirus (N=1/79), were identified in the stool samples. Water samples tested positive for faecal indicator bacteria. Furthermore, the relative risk for being a case and drinking tap water was unequally distributed and peaked close to the place where firefighting took place on 6 December.

CONCLUSIONS:

This epidemiological, laboratory and environmental investigation pointed to the public water supply as the source of the outbreak. A water avoidance notice was applied while the water supply was decontaminated.

PRESENTED BY: DR TOON BRAEYE

Keywords: Waterborne outbreak, acute gastroenteritis, water supply

ESCAIDE reference number: 20110054

OUTBREAKS

Food Poisoning Outbreak Associated with the Ingestion of Traditional Lebanese Ground Raw Meat at a Wedding Reception – Mount Lebanon, 2010

Majd Saleh (1), H. Abou Naja (1), N. Haddad (1), N. Ghosn (1), R. ElHajj (2), G. Matar (3), M. Shehab (3), O. Irani (1), A. Nasreddine (1), R. Louis (1), I. Chamas (1), A. Aoun (1), J. Imed (1), K. Mansour (1), J. Hallal (1)

AFFILIATIONS:

1. Epidemiologic Surveillance Program, Directorate of Prevention, Ministry of Public Health, Beirut Lebanon
2. Agriculture Laboratory, Ministry of Agriculture, Beirut, Lebanon
3. PulseNet Laboratory, Faculty of Medicine, American University of Beirut, Beirut, Lebanon

BACKGROUND:

503 cases of food poisoning were reported in 2010 in Lebanon. Seven of 42 clusters were attributed to ground raw meat, a traditional Lebanese dish. In August 2010, following a wedding reception, over 100 food poisoning patients were reported. Our team investigated the outbreak to identify the agent and the vehicle of infection.

METHODS:

Attendees were enrolled in a retrospective cohort study by telephone interviews using a standard questionnaire derived from the menu served at the wedding. Cases were defined as any one attending the wedding and reported developing one or more symptoms of fever, diarrhea, vomiting, or abdominal pain within three days. Cases were asked about stools sample examination. Food samples from the restaurant and stool specimens from food handlers were requested. Antimicrobial susceptibility, serotyping and genotyping by Pulsed Field Gel Electrophoresis (PFGE) were done. EpiData3.1 and Stata8.0 were used for data entry and analysis.

RESULTS:

215 (83%) of 260 attendees were interviewed and 118 met the case definition (attack rate: 55%). The association with ingestion of raw meat was significant (RR=7.1, 95%CI=4.2-12.1) as well as for seven other food items. Multivariate analysis showed raw meat to be the only significant risk factor (OR: 59.63, p-value: <10⁻⁶). Stool cultures for two cases and the food handlers were negative. Laboratory tests in raw meat confirmed the presence of *Salmonella typhimurium* PFGE type II, susceptible to ampicillin, ceftazidime, ciprofloxacin and trimethoprim-sulfamethoxazole.

CONCLUSIONS:

Epidemiologic and laboratory evidence corroborated contaminated raw meat the source of the outbreak. Awareness on risk of raw meat consumption need be raised. Lack of patient stool cultures was a limitation. Physicians need to be encouraged to ask for stool cultures after food-poisoning. Food safety need be enhanced.

PRESENTED BY: MISS MAJD SALEH

Keywords: Outbreak, food poisoning, Ground raw meat, Salmonella, Pulsed-Field Gel Electrophoresis

ESCAIDE reference number: 20110059

OUTBREAKS

Epidemiological and microbiological investigation of an outbreak of group A streptococcal infection linked to an orthopaedic department

Mahgoub H (1), Double G (2), Hawtin L (2), Swift A (1), Waters E (1), Reacher M (3), Verlander N (4), Efstratiou A (5), Nair P (1)

AFFILIATIONS:

1. Norfolk, Suffolk and Cambridgeshire Health Protection Unit, Healthy Living Centre, Croxton Road, Thetford IP24 1JD
2. James Paget University Hospital, Great Yarmouth, Norfolk,
3. HPA East of England Regional Epidemiology Unit, Forvie Site, Cambridge CB2 0SR
4. Statistics Unit, Health Protection Services Colindale
5. HPA Respiratory and Systemic Infections Laboratory, Microbiology Services Division Colindale, London

BACKGROUND:

Following an increase in community cases of IGAS, three cases of GAS infection linked to a surgical department were reported. An incident team was convened to investigate and control the outbreak.

METHODS:

Cases of hospital-associated (>2 days post-admission) GAS isolates from patients and staff at the hospital were sought, with isolates typed at the reference laboratory. Regionally-developed timeline software was used to detect ward contacts. Information on outbreak cases was collected using a structured questionnaire. On affected wards, clinical staff and the environmental were sampled for microbiological culture.

RESULTS:

There were 10 nosocomial GAS cases, over four wards (acute or orthopaedic or rehabilitation). 6/10 were female, with mean age 86 (range 64–98). 5/10 were invasive infections of which 2/5 (both with co-morbidities) died. 6/10 cases had pre-existing skin ulcers and 4/10 had diabetes. 6/10 had attended a central treatment service for wound dressing. There were case overlaps on three of the four wards. One ward with two prevalent cases had 3 subsequent cases, and GAS was isolated from the ward environment. GAS isolates from all 10 nosocomial cases belonged to a rare emm type 1389.1. None of the 9 staff isolates were emm 1389.1.

CONCLUSIONS:

The results suggested spread of GAS infection within the hospital, with the overlaps and environmental microbiology pointing towards patient to patient spread, either directly or via the environment. There was no evidence for outbreak spread via staff carriage. No increase in other HCAI was seen. Possible risk factors are being explored in an analytic study (results by ESCAIDE 2011).

PRESENTED BY: DR CHRIS WILLIAMS

Keywords: Streptococcal infection, nosocomial

ESCAIDE reference number: 20110091

POSTER SESSION ABSTRACTS

OUTBREAKS

Outbreak of *Salmonella* Typhimurium associated with a product with EU-protected geographical indication, Germany 2010

Hélène Englund (1, 2, 3), W. Hautmann (1)

AFFILIATIONS:

1. Bayerisches Landesamt für Gesundheit und Lebensmittelsicherheit, Oberschleissheim, Germany.
2. European Programme for Intervention Epidemiology Training (EPIET), ECDC, Stockholm, Sweden.
3. Postgraduate Training in Applied Epidemiology (PAE), Robert Koch Institute, Berlin, Germany.

BACKGROUND:

In November 2010, an increase of *Salmonella* Typhimurium cases was detected by the local health authority in Hof, northern Bavaria, Germany. Initial interviews with cases identified that several had consumed 'Hofer Rindfleischwurst' – an uncooked sausage with protected geographical indication. We aimed to confirm the vehicle of infection through a matched case-control study and take measures to prevent further cases.

METHODS:

We sent out questionnaires focusing on meat and sausage consumption to all households with cases of laboratory-confirmed *Salmonella* Typhimurium or uncharacterized *Salmonella* group B reported between weeks 46/2010 and 02/2011. All household members were asked to fill out questionnaires. Cases with symptom onset between 10–24 November, who had not travelled abroad in the prior week, were included in the study. Household members of cases, without symptoms of salmonellosis (diarrhoea, spasmodic abdominal pains or vomiting), were chosen as controls. Odds ratios for different exposures were calculated.

RESULTS:

Eighty-one laboratory-confirmed cases were notified during the period; thirty-one (38.3%) required hospitalization. Forty-six responded to the questionnaire and matched our inclusion criteria. For 21/46 cases, household controls were available. The analysis showed that cases were more likely to have consumed Hofer Rindfleischwurst (OR 11.56, 95% CI 1.68-infinite) and to have eaten outside of their home (OR 14.88, 95% CI 1.96-722.76) than their matched controls.

CONCLUSIONS:

Raw sausages have repeatedly been associated with *Salmonella* infections. The high odds-ratio associated with consumption of Hofer Rindfleischwurst supports it as the likely vehicle of infection in this outbreak. The protected geographical indication acts as a quality indicator, but food safety requirements are not reviewed. However, the production of raw sausages should be monitored closely to prevent further outbreaks of severe gastro-intestinal illness due to *Salmonella*.

PRESENTED BY: MS HÉLÈNE ENGLUND

Keywords: Case-Control Studies, Retrospective Studies, *Salmonella* Typhimurium, Disease Outbreaks, Food safety, European Union

ESCAIDE reference number: 20110111

OUTBREAKS

Outbreak of Shiga toxin-producing *Escherichia coli* serotype O104:H4 in Germany: cohort study of a cluster in Lower Saxony

Martina Scharlach (1), M. Diercke (1, 2, 3), J. Dreesman (1), N. Jahn (1), M. Kriek (1), K. Beyrer (1), M. Pulz (1), R. Floride (4)

AFFILIATIONS:

1. Governmental Institute of Public Health of Lower Saxony, Germany
2. Postgraduate Training for Applied Epidemiology (PAE), Robert Koch Institute (RKI), Berlin, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
4. Local Public Health Department, Cuxhaven, Germany

BACKGROUND:

In May 2011 one of the worldwide largest outbreaks of haemolytic uremic syndrome (HUS) and bloody diarrhoea caused by Shiga toxin-producing *Escherichia coli* (STEC) serotype O104:H4 has been observed in Germany. One of the most affected federal states was Lower Saxony. Among various clusters we identified a 70th birthday celebration that was served by a local catering company.

METHODS:

We conducted a retrospective cohort study. All attendants of the celebration were interviewed by telephone for food they consumed at the celebration. A case was a participant of the celebration who was reported with STEC to the local public health department until 25 May 2011. For univariable analysis and multivariable logistic regression, association between disease and food was explored by using Odds Ratios (OR) with 95% confidence interval (95%CI).

RESULTS:

Of 85 attendants, 72 could be reached by telephone and agreed to participate in the study. Median age of study population was 64 years. Seven cases were identified; two of them developed a HUS. Mean incubation period was 9 days. Univariable analysis explored four food items for association with STEC-infection: shrimp (OR 3.0, 95%CI 0.31-70.96), snow peas (OR 2.06, 95%CI 0.19-52.00), sprouts (OR 1.40, 95%CI 0.11-38.88) and cream (OR 1.06, 95%CI 0.14-9.33). Multivariable logistic regression showed an association with STEC-infection for snow peas (OR 1.65, 95% CI 0.98-2.78) only. All associations were not statistically significant.

CONCLUSIONS:

The sprouts, identified as cause of the whole outbreak, were used for decoration by the catering company, but study participants could not remember that well. Sprouts for decoration were mostly not recognised. The challenge to identify the source of the whole outbreak may be due to that.

PRESENTED BY: DR MARTINA SCHARLACH

Keywords: Shiga toxin-producing *Escherichia coli*, serotype O104:H4, disease outbreak

ESCAIDE reference number: 20110114

OUTBREAKS

Water born shigellosis outbreak in the Echmiadzin city of Armenia, January, 2009

L. Avetisyan, T Rush, E. Maes

AFFILIATIONS:

1. South Caucasus Field Epidemiology and Laboratory Training Program (SC/FELTP).
2. State Hygienic and Anti epidemic Inspectorate, MOH, Armenia

BACKGROUND:

In January 2009, we reported an outbreak with 70 cases of shigellosis in Echmiadzin, Armenia. We conducted an investigation to reveal the etiology, the source and transmission route, and to control the outbreak.

METHODS:

We conducted a retrospective cohort study and an active house to house survey to detect patients with symptoms of shigellosis in a neighborhood consisting of 3 streets. A probable case was defined as diarrhea (bloody or watery), vomiting, abdominal pain, and temperature ($\geq 38.0^{\circ}\text{C}$) occurring within a 5 day period preceding the investigation. We collected stools from interviewed patients, 87 water, and 107 food samples. Samples were tested at the CDC Armenia. Questionnaires were completed for the population living on 3 streets in Echmiadzin. We computed the risk ratio (RR).

RESULTS:

753 people were included in the survey; samples from 350 were tested. 58 cases were detected during the survey and 12 cases were identified by passive surveillance for a total of 70 cases. 21 (30.0%) cases were in adults, 49 (70.0%) were in 0–14 years old, 48 (68.6%) cases were among females, and 22 (31.4%) were in males. *Shigella flexneri* 1b was detected in 15 (17.2%) drinking water samples, as well as in 11 (15.7%) of the stool samples from cases. Other risk factors were not identified. 4 damaged water lines with one being an illegal connection were detected upon investigation of the city water system.

CONCLUSIONS:

Shigellosis was caused by contaminated drinking water from the centralized system (RR of =12.3; 95% C.I (5.39-28.01) and damaged water lines were the main factor for infection. We recommended that the water supply company strengthen the control of water lines and correct the illegal water pipe connections.

PRESENTED BY: DR LILIT AVETISYAN

Keywords: Shigellosis, water supply system, transmission, outbreak

ESCAIDE reference number: 20110128

OUTBREAKS

A food-borne *Cryptosporidium parvum* outbreak at a conference centre Umeå, Sweden – October 2010

Alin Gherasim (1, 2), V. Decraene (1, 2), A. Wallensten (2), A. Kling (2), M. Insulander (3), L. Skedebant (4), J. Wiström (4), M. Wahter (5), M. Hjertqvist (2)

AFFILIATIONS:

1. European Program for Intervention Epidemiology Training (EPIET), European Center for Disease Prevention and Control (ECDC), Solna, Sweden
2. Department of Epidemiology, Swedish Institute for Communicable Disease Control (SMI), Solna, Sweden
3. County Medical Office, Stockholm, Stockholm County, Sweden
4. County Medical Office, Umeå, Västerbotten County, Sweden
5. Environmental Health Office, Umeå, Sweden

BACKGROUND:

In October 2010, the Swedish Institute for Communicable Disease Control was notified about three confirmed cases of *Cryptosporidium* spp., among attendees at a national conference in Umeå. We conducted an investigation to assess the outbreak's magnitude and identify its source and vehicle of transmission.

METHODS:

We performed a cohort study using a web-based questionnaire about symptoms and food history. A case was any person who attended the conference on October 4–5 and developed diarrhea (>3 loose-stools/day) with onset between 2–12 days afterwards. Stool samples from attendees and employees were requested. An environmental investigation evaluated the food safety procedures.

RESULTS:

Out of 278 persons attending the conference, 203 replied. Eighty-nine persons met the case definition. The mean incubation period was 7.5 days (range: 2–13), while symptoms median duration was 5 days (2–21). Illness was associated with attending the dinner (RR=2.4, 95%CI=3.4-167.0) and reception drinks (RR=2.1, 95%CI=1.4-3.1). Chanterelle sauce (RR=4.2, 95%CI=0.6-25.9) and salad garnish (RR=2.2, 95%CI=0.95-4.96) were the main food items suspected as vehicles, both with high attack rates (60%). *Cryptosporidium* sp was diagnosed in seven of 23 stool samples. Genotyping identified *C. parvum* in 6 isolates. Eight employees responded but none gave stool samples. None were sick prior to the conference but one fell ill after consuming the dinner dish. No food was available for microbiological analysis. No violation of food safety procedures was found.

CONCLUSIONS:

Though the source of this outbreak remains unclear, our results suggest uncooked vegetables as the probable vehicle of transmission. All food items were served on the same plate which can indicate cross-contamination and explain the relative risks found. Our investigation highlights the need of a better trace back capability regarding vegetables.

PRESENTED BY: MR ALIN GHERASIM

Keywords: *Cryptosporidium parvum*, outbreak, cohort study, diarrhea

ESCAIDE reference number: 20110204

POSTER SESSION ABSTRACTS

OUTBREAKS

Patients hospitalized with *Cryptosporidium hominis* infection during a massive outbreak of waterborne cryptosporidiosis in Östersund, Sweden, November 2010

Micael Widerström, M Omberg, I Svensson, M Rundvik, J Wiström

AFFILIATIONS:

Department of Communicable Disease Control and Prevention, County of Jämtland, Sweden

BACKGROUND:

In late November 2010 a large outbreak of waterborne cryptosporidiosis occurred in the city of Östersund, Sweden (population of approximately 60,000). A boil water notice was issued on the 26 of November and *Cryptosporidium hominis*, genotype IbA10G2 was subsequently detected in tap water. An online questionnaire was published within 18 hours of the outbreak notification. In the following 10 days more than 12 000 subjects with gastrointestinal symptoms from all parts of the city responded. A total of 145 people (median age 40 y) had laboratory-confirmed cryptosporidiosis.

METHODS:

Here we present a case series of the patients hospitalized with cryptosporidiosis during the outbreak period (November 2010 – January 2011).

RESULTS:

A total of 62 patients were identified including 37 women and 25 men with a mean age of 66 y (range 13 to 98 y). At the peak of the outbreak 20 patients were hospitalized concurrently. The median period of hospitalization was 5 days (range 1–125). At admission the dominating symptoms were watery diarrhea and bowel discomfort, the median temperature was 38°C (range 36.0–40.3), the median levels of CRP, total WBC and serum creatinine were 24 mg/L (0.6–250), $9 \times 10^9/L$ (2.2–28.2) and 74 $\mu\text{mol/L}$ (42–1398), respectively. All patients were treated with intravenous fluids. Twenty patients were immunosuppressed, of whom four organ transplant patients with relapsing diarrhea and weight loss were treated with nitazoxanide for 4 to 60 days. There was no attributable mortality.

CONCLUSIONS:

During an outbreak of cryptosporidiosis demands on the healthcare service increases substantially and hospitalization is frequently required, particularly among the elderly and the immunosuppressed persons.

PRESENTED BY: DR MICHAEL WIDERSTRÖM

Keywords: *Cryptosporidium*; disease outbreaks; disease transmission, infectious; gastroenteritis

ESCAIDE reference number: 20110209

SURVEILLANCE

Evaluation of Shigellosis Surveillance System in Armenia, 2010

L. Avetisyan, T Rush, E. Maes

AFFILIATIONS:

1. South Caucasus Field Epidemiology and Laboratory Training Program (SC/FELTP), Georgia
2. State Hygienic and Antiepidemic Inspectorate, MOH, Armenia, mobile phone: +37493536746, e-mail: avetisyan_lil@yahoo.com

BACKGROUND:

Annually, 80 million cases and 700,000 deaths due to *Shigella* are registered worldwide. In Armenia, 800–1000 cases were registered yearly between 2005 and 2010. Incidence ranged from 24.5–32.1 per 100,000 population. We evaluated the shigellosis surveillance system and made recommendations.

METHODS:

We examined surveillance documents, records, and sample flow. We performed a retrospective data analysis (for 2005 to 2010) of 15 doctors and 158 registers from 4 hospitals and 6 ambulatory units in 3 regions of Armavir marz and in the Community Centre of Yerevan for the 2005 to 2010 period.

RESULTS:

The surveillance system is operative at community, marz (regional) and national levels. The existing surveillance system is passive, population- and case-based, and operates routinely and actively only when epidemiologically connected cases are registered. We found 132 officially confirmed cases versus 139 according to clinical records; 136 (97.8%) were laboratory confirmed. Of those confirmed, 57 (41.9%) were typed to genus, and 79 (58.1%) typed to species. Only 32 cases (20.3%) were clinically diagnosed as “acute shigellosis”. In our survey, over 95% (132 of 139) of cases were reported; a positive predictive value of 87.5%.

CONCLUSIONS:

Shigellosis incidence rate is as officially reported from 2005–2009. Health facilities do not follow standard case definition. 7 cases (139–132=7) were missed by the system. Laboratory isolates were not fully typed. The system is however simple and representative. Standard reporting forms are used and 92% of health workers said these were easy to complete. Stability is limited due to low number of epidemiologists – 12 regions in Armenia do not have epidemiologists. We recommend training on standard case definitions, efficient information transfer, and better laboratory support.

PRESENTED BY: DR LILIT AVETISYAN

Keywords: Shigellosis, surveillance, sampling study, case definition, laboratory support

ESCAIDE reference number: 20110132

SURVEILLANCE

Local Public Health Authorities' Perception of the German Infectious Diseases Surveillance System – in the light of International Health Regulations –

Ute Rexroth (1, 2, 3), R. Zimmermann (1), T. Eckmanns (1), D. Matysiak-Klose (1)

AFFILIATIONS:

1. Robert Koch Institute, Department for Infectious Disease Epidemiology, Berlin, Germany.
2. Postgraduate Training for Applied Epidemiology (PAE, German FETP) and European Programme for Intervention Epidemiology Training (EPIET).

BACKGROUND:

The 2009/10 influenza pandemic or the 2011 STEC outbreak demonstrate recurrent public health threats by infectious diseases. According to the revised International Health Regulations (IHR 2005), local public health authorities (LPHA) must identify and communicate possible events of public health concern immediately. This study aimed to assess LPHA' perception of the German infectious disease surveillance system in order to identify possibilities for improvement.

METHODS:

We sent a paper-and-pencil questionnaire to all German LPHA in 2008, asking for their resources, collaborations and services. Using univariable and multivariable analysis, influences on collaborations were investigated and LPHA with special responsibilities defined by population size, large hospitals, international airports, harbours and primary asylum camps in their region were compared to others.

RESULTS:

Of 410 authorities, 351 (86%) responded. The majority reported close collaborations with federal authorities (92.9%) and hospitals (65.8%). Only 36.5% (127/348) estimate that practicing physicians notify events regularly. According to 40.5% (140/346), notifications are often or always incomplete, leading to a delay of IHR reporting to federal and national authorities. LPHA with special responsibilities (213/351) are more likely to provide on-call duties (63.8% vs. 50.4%, $p=0.013$). However, they report less close collaborations with physicians (close in 36.5% vs. 43.1%, $p=0.326$) and less complete notifications (complete in 54.8% vs. 66.7%, $p=0.028$). In multivariable analysis, LPHA offering staff trainings or analysing own data report closer collaborations with physicians ($p=0.016$; $p=0.015$, respectively).

CONCLUSIONS:

Physicians' input is essential for infectious disease surveillance. However, the perception of German LPHA is that physicians' collaboration is problematic. Further efforts are needed to ensure complete and timely notifications. Staff trainings and local feedback on surveillance data might improve the interaction between LPHA and physicians.

PRESENTED BY: DR UTE REXROTH

Keywords: Epidemiology, population surveillance, communicable disease control, disease notification

ESCAIDE reference number: 20110153

SURVEILLANCE

Poor sensitivity of the Slovenian Surveillance System for Sexually Transmitted Infection with Chlamydia trachomatis

Tanja Kustec (1, 2), D. Keše (3), I. Klavs (1)

AFFILIATIONS:

1. National Institute of Public Health, Ljubljana, Slovenia
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
3. Institute of Microbiology and Immunology, Medical Faculty, University of Ljubljana

BACKGROUND:

During 2001–2010, reported rates of sexually transmitted infection (STI) with Chlamydia trachomatis (chlamydia infection) in Slovenia varied from 6–11/100,000, among the lowest in Europe. Our objective was to assess sensitivity, data quality, and simplicity of the surveillance system.

METHODS:

Surveillance results for 2001–2010 were triangulated with testing rates, diagnosed rates in one laboratory, and results of the National Survey of Sexual Lifestyles, Attitudes, and Health (NSSLAH), 2000.

RESULTS:

Sensitivity: During 2001–2010, reported chlamydia infection rates in 18–49 year-old women varied from 6–26/100,000. In the NSSLAH, chlamydia infection was diagnosed in 1.6% of 18–49 year-old women. Had all these infections been reported in 2000, this would correspond to 1600/100,000 women 18–49 years old. During 2001–2010, national testing rates varied from 151–416/100,000 and diagnosed chlamydia rates in laboratories from 14–26/100,000. Overall 35.8% diagnosed cases in one laboratory in 2007–2010 were reported to the national level. Data quality: Non-response for demographic data was <1% and for risk behaviour data >40%. Simplicity: The surveillance system requires all physicians to report diagnosed cases with information on 25 variables including eight sexual behaviour variables.

CONCLUSIONS:

Sensitivity of chlamydia surveillance system is very low which is mostly due to low testing rates and partly to physicians not reporting cases diagnosed in laboratories. The data quality for demographic variables, which are important for public health decisions, is fairly good; little information is missing. Introduction of mandatory laboratory case reporting system with shorter list of variables (including coded surname, date of birth, gender, municipality, date of diagnosis, reporting physician specialty) should simplify the surveillance system, improve its sensitivity and provide necessary information while reducing the workload.

PRESENTED BY: MRS TANJA KUSTEC

Keywords: Evaluation surveillance system, chlamydia infection, sensitivity, data quality, simplicity

ESCAIDE reference number: 20110163

POSTER SESSION ABSTRACTS

SURVEILLANCE

Burden of communicable disease in Germany – preliminary results from the Burden of Communicable Diseases in Europe (BCoDE) pilot study

Dietch Plass (1), Paulo Pinheiro (1), Alexander Krämer (1), Cheryl Gibbons (2), Marie-Josée Mangen (3), John Brooke (3), Alessandro Cassini (4), Piotr Kramarz (4), Mirjam Kretzschmar (5)

AFFILIATIONS:

1. University of Bielefeld (Bielefeld)
2. University of Edinburgh (Edinburgh)
3. University Medical Centre Utrecht (UMCU) (Utrecht)
4. European Centre for Disease Prevention and Control (ECDC) (Stockholm)
5. National Institute for Public Health and the Environment (RIVM), Centre for Infectious Disease Control Netherlands (Bilthoven)

BACKGROUND:

To provide estimates of the burden of communicable diseases in Europe, the ECDC initiated the BCoDE project in 2009. The pilot study in four European countries (Estonia, Germany, Italy, and The Netherlands) aims at testing and improving the developed methodology.

METHODS:

Disability Adjusted Life Years (DALY) were used to estimate the disease burden for measles, influenza, HBV and salmonellosis in Germany. A pathogen-based approach was developed to account for long-term sequelae. Multiplication factors were applied to adjust for under-estimation.

RESULTS:

For the study period of 2005–2007, annual averages of 882 DALYs for measles, 34,690 DALYs for influenza, 6,839 DALYs for HBV and 3,575 DALYs for salmonellosis were calculated for the German population. DALY rates per 100,000 were 0.99 for measles, 39.79 for influenza, 8.18 for HBV and 4.34 for salmonellosis. For measles and influenza the acute burden accounted for 97.4% and 94.5% and the sequelae burden for 2.6% and 5.5% of the total burden, respectively. For HBV and salmonellosis, the acute burden accounted for 2.6% and 35.0% and the sequelae burden for 97.4% and 65.0% of the total burden, respectively. Stratified by sex the disease burden for measles, influenza, HBV and salmonellosis for men was 1.03, 43.09, 8.04 and 4.29 DALY/100,000, respectively and 0.95, 41.19, 8.30 and 4.39 DALY per 100,000 population for women, respectively.

CONCLUSIONS:

The preliminary results indicate that the BCoDE methodology allows for comprehensively estimating the impact of infectious pathogens on population health in Germany. For HBV and salmonellosis, the approach highlights the impact of long-term sequelae with 97.4% and 65.0% of the total DALY burden. Refinement of methodology is currently under way and will provide improved estimates for most diseases involved in EC-Decision 2119/98.

PRESENTED BY: MR DIETRICH PLASS

Keywords: Burden of disease, communicable diseases, disability adjusted life years, Germany

ESCAIDE reference number: 20110181

SURVEILLANCE

How the choice of laboratory methods affects the surveillance of enteropathic *Escherichia coli* in Germany

Hélène Englund (1, 2, 3), W. Hautmann (1)

AFFILIATIONS:

1. Bayerisches Landesamt für Gesundheit und Lebensmittelsicherheit, Oberschleissheim, Germany.
2. European Programme for Intervention Epidemiology Training (EPIET), ECDC, Stockholm, Sweden.
3. Postgraduate Training in Applied Epidemiology (PAE), Robert Koch Institute, Berlin, Germany.

BACKGROUND:

Some intestinal *Escherichia coli* can cause gastrointestinal disease and are divided into pathovars (e.g. EHEC, EPEC, ETEC, EIEC, EAaggEC and DAEC). Virulence factors, detectable through PCR, confer the pathogenicity. Non-EHEC pathovars are sometimes assigned based on O-antigens, although serotypes do not confer pathogenicity. In Germany, laboratories must notify all findings of enteropathic *E. coli* to their local health authority (LHA). The LHAs must report all laboratory confirmed cases, where laboratories have assigned a non-EHEC pathovar following PCR or isolation of *E. coli*, to the regional authority.

METHODS:

We assessed the information in enteropathic non-EHEC *E. coli* case reports from Bavarian LHAs from 2007–2010, in order to suggest surveillance improvements to guide interventions.

RESULTS:

In total, 3976 cases were reported; 2295 (58%) were classified as laboratory confirmed. Of those, 77% stated isolation of *E. coli* as only method used; 49% of these also stated an O-antigen. PCR was mentioned in 522 (23%) reports. The pathovar was lacking from 1404 (35%) reports. Reports were 6.8 times more likely to contain a pathovar if PCR, rather than isolation of *E. coli*, was the only method stated ($p < 0.001$).

CONCLUSIONS:

The non-laboratory confirmed cases suggest that many persons are not conclusively diagnosed or that the information transfer within the surveillance system needs to be strengthened. The O-antigens reported, indicate that serotyping was used to assign pathovars and that the pathogenicity is doubtful. Laboratories should prefer methods that detect virulence factors, so that pathovars are assigned based on pathogenicity, and conclusive diagnoses can be made. Thereby, the surveillance could become more specific, allowing better estimations of the burden of disease, and could thus better alert public health authorities regarding the need for interventions.

PRESENTED BY: MS HÉLÈNE ENGLUND

Keywords: *Escherichia coli*, disease notification, investigative techniques, polymerase chain reaction, serotyping

ESCAIDE reference number: 20110191

SURVEILLANCE

Timeliness of hepatitis B notification: a comparison between laboratories and the effect of the new law on Public Health in the Netherlands

C. M. Swaan (1), T. W. Bravo Rebolledo (1), E. J. M. de Coster (2), J. E. van Steenbergen (1)

AFFILIATIONS:

1. Preparedness and Response Unit (LCI), Centre for Infectious Disease Control, National Institute for Public Health and the Environment (RIVM), Bilthoven, the Netherlands
2. Municipal Health Service, GGD Den Haag, The Hague, the Netherlands

BACKGROUND:

Timely notification of infectious diseases is essential for MHS to initiate effective control measures. With the new law on Public Health installed December 2008, besides physicians also diagnosing laboratories need to notify infectious diseases, as hepatitis B, nominatively within one working day to MHS. Laboratories use different logistic systems for notification. This study compares the timeliness of hepatitis B notification between laboratories and investigates the effect of the new law on local level (province of South Holland, 3.5 million inhabitants).

METHODS:

Delay between dates of diagnosis and notification was analyzed for 1068 hepatitis B laboratory diagnoses, both acute and chronic infections, made by 9 laboratories to 5 MHS in South Holland province during the period 1.1.2005 and 1.1.2010. A qualitative survey among the 5 MHS analysed changes in notification procedures since 2009.

RESULTS:

Median delay between hepatitis B diagnosis and notification was 0,0 days (75th percentile (P75): 2,0 days, 95th percentile (P95): 6,6 days), with significant difference between laboratories (range 0,0-2,0, P75: 0,5-6,5, P95: 2,8-43,3 days, $p=0,00$ Kruskal-Wallis). 73,1% of the diagnoses were notified ≤ 1 working day. Median delay in 2009 was identical as in 2005-2008 (0,0 days), but improved (P75 from 2 to 1 and P95 from 7 to 5 days before and since 2009, $p=0,09$ Mann-Whitney). This is in line with feedback from MHS's which in most cases experienced little change in notification procedures.

CONCLUSIONS:

Nine investigated laboratories in South Holland province, show considerable variation in timeliness of hepatitis B diagnoses to MHS's. The majority is timely notified according the law. Timeliness improved, however not significant, with the new law. Further investigation into laboratory notification systems and the relation with timeliness of notification is initiated.

PRESENTED BY: MRS CORIEN SWAAN

Keywords: Surveillance, laboratory notification, timeliness, hepatitis B, public health law

ESCAIDE reference number: 20110210

SURVEILLANCE

The performance of mandatory and sentinel surveillance systems for communicable diseases: lessons to learn from the Italian experience

Chiara de Waure (1), S. Longhi (1), E. Franco (2), C. Rizzo (3), S. Capizzi (1), M. Fabiani (3), S. Declich (3), W. Ricciardi (1)

AFFILIATIONS:

1. Institute of Hygiene, Catholic University of the Sacred Heart, Rome, Italy
2. Tor Vergata, University of Rome, Italy
3. National Institute of Health (ISS), Rome

BACKGROUND:

The surveillance of Communicable Diseases (CDs) is a milestone in Public Health and is performed through mandatory and sentinel surveillance systems. This work is aimed at comparing their performance in Italy through two case studies: measles and HBV. Both are mandatorily notified to the Italian Surveillance System for CDs; furthermore two voluntary surveillance systems are in place.

METHODS:

Measles system relies on an average of 300 primary care pediatricians per year (SPES) while HBV one (SEIEVA) collects data on acute hepatitis from local health authorities covering approximately 60% of the population; both systems are regarded as representative of the Italian Regions. Incidence data per 100,000 inhabitants, from 2005 to 2008, were collected from sentinel systems; for the mandatory one, they were computed dividing notifications by resident population reported from the National Institute of Statistics. Data were stratified by age groups: 0, 1-4; 5-9 and 10-14 for measles and 0-14, 15-24 and ≥ 25 for HBV.

RESULTS:

On the whole incidence data from SPES were 15% to over 100% higher than those from the mandatory system with slight differences between age groups; interestingly, incidence data from the two systems were closer during 2008 when an outbreak occurred. On the other hand, SEIEVA yielded incidence data from 26% to 12% lower than those coming from the mandatory system, except for 2008 when the overall incidence from SEIEVA was higher. Differences between age groups were shown for HBV as well, being the gap closer in ≥ 25 years old.

CONCLUSIONS:

These preliminary results suggest that sentinel surveillance systems can improve CDs monitoring and that the integration of different data sources is important to have a comprehensive view of the problem.

PRESENTED BY: DR SILVIA LONGHI

Keywords: Communicable Diseases, Surveillance

ESCAIDE reference number: 20110236

POSTER SESSION ABSTRACTS

SURVEILLANCE

10 years of mandatory Creutzfeldt-Jakob Disease surveillance in Germany, 2001–2010

Maria Wadl, Ruth Offergeld, Matthias an der Heiden, Tim Eckmanns

AFFILIATIONS:

Robert Koch Institute, Berlin, Germany

BACKGROUND:

Creutzfeldt-Jakob Disease (CJD) is a progressive neurological disorder, which is incurable and unexceptionally fatal. CJD belongs to the human spongiform encephalopathies which appear as sporadic, acquired (such as iatrogenic CJD, variant CJD, Kuru) and hereditary forms. We analysed German CJD data to describe epidemiological trends and to adjust recommendations accordingly.

METHODS:

We performed a descriptive analysis of all mandatorily notified CJD cases fulfilling the case definition between 2001 and 2010 by time, place and demographics. Hereditary forms are not notifiable in Germany. Poisson regression was carried out to see a possible trend over time regarding the frequencies of all CJD cases and of neuropathologically confirmed (definite) CJD cases.

RESULTS:

Within the mandatory surveillance system a total of 923 CJD cases were notified between 2001 and 2010. The cumulative incidence was 0.11 cases per 100,000 inhabitants. Of the 884 (97%) CJD cases classified, 882 were regarded as sporadic, two as probable iatrogenic and none as variant CJD cases. Eighty-two percent of all CJD cases were 60 years or older, 54% of them were female. While the frequency of all CJD cases increased on average 6% per year (95% CI: 4-8; $p=0.000$), the frequency of definite CJD cases decreased on average 4% per year (95% CI: 0-8; $p=0.049$) due to a constant decrease in neuropathological confirmations (from 51% in 2001 to 20% in 2010).

CONCLUSIONS:

Until 2010, no vCJD case has been identified in Germany. The cumulative incidence of CJD in Germany as well as the age and gender distribution is comparable to other countries. The increasing incidence per year might be explained by better reporting behaviour. Neuropathological confirmation of CJD cases needs to be enhanced.

PRESENTED BY: DR MARIA WADL

Keywords: Prions – Creutzfeldt-Jakob Disease – Surveillance – Neuropathology

ESCAIDE reference number: 20110261

SURVEILLANCE

Estimation of the completeness of the surveillance for Salmonella Typhi and Paratyphi – Denmark, 2000–2010

Charlotte Kjelsø (1), K. Mølbak (1), L. Müller (1), S. Ethelberg (1, 2)

AFFILIATIONS:

1. Department of Epidemiology, Statens Serum Institut, Copenhagen, Denmark
2. Department of Microbiological Surveillance and Research, Statens Serum Institut, Copenhagen, Denmark

BACKGROUND:

In Denmark, surveillance of infectious diseases is based on two different systems. A clinical system, with notifications from physicians (CSS), and a laboratory surveillance system (LSS). The latter system is generally thought to be very efficient, although this has not been formally examined. Most diseases are only covered by one of the two systems. However, Salmonella Typhi and Salmonella Paratyphi A and B are covered by both. Using data for these two diseases, we estimated the completeness of the two surveillance systems.

METHODS:

Data on typhoid and paratyphoid cases in Denmark for the years 2000–2010 were collected from CSS and LSS. Data were merged and analyzed using capture-recapture methodology to estimate the real number of cases and the sensitivity of each system.

RESULTS:

For S. Typhi, 183 cases were notified within both surveillance systems. We estimated that the real number of cases was 186 and the sensitivity of CSS was 90% and the sensitivity of LSS 88%. For S. Paratyphi A and B, a total of 182 cases were notified and we estimated the number of real cases to be 187. The sensitivity was estimated as 72% for CSS and 94% for LSS.

CONCLUSIONS:

The results indicate that most cases are captured by surveillance in one of the two systems, but that the laboratory surveillance system for gastrointestinal bacteria does not capture all diagnosed cases. However, results for S. Typhi and Paratyphi may not be generalised to all salmonellae, because typhoid salmonellae are more often diagnosed from blood specimens, which may be reported less frequently than results from faecal specimens. Procedures for collecting cases within the laboratory systems should be further examined in order to optimise surveillance.

PRESENTED BY: MRS CHARLOTTE KJELSO

Keywords: Surveillance

ESCAIDE reference number: 20110286

SURVEILLANCE

Human Tularemia Surveillance System Evaluation in Georgia, 2006–2010

Sophio Datukishvili, Tom Rush, Ed maes, Marika Geleishvili

AFFILIATIONS:

FELTP: South Caucasus, Fellow

BACKGROUND:

Tularemia is a worldwide zoonotic bacterial disease. The first cases of tularemia in Georgia were registered in 1946 and the geographical foci include Samtskhe-Javakheti, Kakheti and Kartlian plains.

METHODS:

Evaluation of the tularemia surveillance system was performed according to the US CDC "Guidelines for Evaluating Public Health Surveillance Systems". We reviewed 2006–2011 data from human tularemia cases from the Georgia National Center for Disease Control and Public Health (NCDC&PH) and from the Electronic Integrated Disease Surveillance System (EIDSS).

RESULTS:

From 2006 to 2011, 44 cases of human tularemia were officially reported with a prevalence rate of 0.1–0.7 per 100 000 population. Laboratory records indicate that 158 persons were tested for tularemia and 50 (32%) were positive – of the 5 (10%) were confirmed by both serology and PCR. 153 serologies, 22 Polymerase Chain Reactions (PCR) and 5 bacteriology tests were performed at NCDC&PH laboratory during this period. 49 (32%) serologies, 6 (27%) PCRs and 0 (0%) cultures were positive for tularemia. Serology tests were performed using in-house, diagnostic antigen (with non-defined specificity and sensitivity). Only 46% of patient records were completely entered into EIDSS. Of 65 entries reported in EIDSS as Tularemia, only 32 (49%) were marked as confirmed. Time period between symptoms onset and diagnoses was approximately 30 days

CONCLUSIONS:

We evaluated some attributes of the tularemia surveillance system, and found it complex (64 variables on EIDSS forms), but not flexible or acceptable. We could not calculate PPV and stability. There is a discrepancy in official statistics, log-books and EIDSS data. We recommend enhancing coordinated work through training to improve data entry, proper specimen collection and timeliness of confirmation. Test specificity and sensitivity and SOPs are also needed.

PRESENTED BY: MS SOPHIO DATUKISHVILI

Keywords: Tularemia, surveillance, PCR, serology, EIDSS

ESCAIDE reference number: 20110330

SURVEILLANCE

Evaluation of the Surveillance System for Legionnaire's disease in Portugal 2004–2010

*Presenting author: Dafina Petrova Dobрева (1), ddobreva@dgs.pt
Authors: Dafina Petrova Dobрева (1, 4), Carlos de Orta Gomes (1), Teresa M. Alves Fernandes (1), Marina Lurdes Ramos (1), Maria Teresa Marques (2, 3)*

AFFILIATIONS:

1. Direcção-Geral da Saúde (DGS), Lisbon, Portugal.
2. Director of the Department of Pathology and Laboratory Medicine, Centro Hospitalar de Lisboa Ocidental
3. Microbiology Department, Faculdade Ciências Médicas, Universidade Nova de Lisboa, Chronic Disease Research Center – CEDOC, Lisbon, Portugal.
4. European Programme for Intervention Epidemiology Training, ECDC

BACKGROUND:

The Portuguese Legionnaire's disease Epidemiological Surveillance System is statutory with paper based reporting from physicians and the laboratories. In 2004 it integrated the laboratories of Santa Cruz Hospital, the Faculty of Medical Sciences of the Universidade Nova, and the National Institute of Health. Because it will merge into the electronic National Surveillance System in 2011 we evaluated its performance until 2010 in order to give recommendations for improvement.

METHODS:

Completeness was evaluated by determining cases of clinical pneumonia with laboratory confirmation of *Legionella pneumophila* for confirmed and *Legionella* spp. for probable cases; percentage of cases reported through obligatory declaration and laboratory notification; number of corresponding environmental investigations and percentages of complete entries and timeliness was evaluated by the number of days between onset, diagnosis, notification, epidemiological investigation and intervention.

RESULTS:

16.3% of 639 cases were culture positive. Notifications accompanied by both clinical and laboratory form was below 50% for 2005 and 2010 but 69% for 2008. On average 81% of the entries for 24 compulsory variables were complete (sample 2010). The median time from disease onset to health authorities' notification was 13 days and another 13 days for the notification to arrive at the General Directorate of Health (DGS) (2010 sample). 30% of 224 environmental investigations were concluded.

CONCLUSIONS:

Although the systems' performance is expected to improve with the upcoming Internet based reporting the results suggest that more efforts are needed to improve completeness of reporting forms and time to notify the health authorities. The mandatory collection of specimens for culture should be revised or strategy should be proposed to increase the number of specimens collected.

PRESENTED BY: DR DAFINA DOBREVA

Keywords: Data, quality, surveillance, legionellosis

ESCAIDE reference number: 20110347

POSTER SESSION ABSTRACTS

SURVEILLANCE

Evaluation of Surveillance System for Hepatitis B in Pregnant Women in Baku, Azerbaijan May 2009–July 2010

Khanim Salahova, S. Agayev, M. Geleishvili, T. Rush, E. Maes

AFFILIATIONS:

FELTP: South Caucasus

BACKGROUND:

Worldwide, 350 million people contract chronic hepatitis B (HBV) and 90% of non-vaccinated children born to positive mothers become virus carriers throughout their life. The 3 dose vaccination on appropriate schedule, plus HBIG (hepatitis B immunoglobulin) at birth is 95% effective in protecting children from infection from mothers with HBV. In 2009, 465 new cases of hepatitis B were reported in Azerbaijan; prevalence of hepatitis B in Azerbaijan is 5.23 per 100,000 people. 172 (38%) of all cases were registered in Baku. We evaluated the effectiveness of the surveillance system for hepatitis B in pregnant women in Baku.

METHODS:

We collected data on laboratory testing, and reviewed case report forms received from the Health care Department and all health care facilities in Baku between May 2009 and July 2010.

RESULTS:

As a result of the screening program, 573 newborns from 1,042 HB positive mothers (55%) received HBIG. We also found the system simple, flexible and acceptable (simple, completed forms with limited levels of reporting). From May 2009 to July 2010, 67,871 women were tested for HBsAg; of these, 1,147 were positive by rapid diagnostic tests, and 1,042 (90.8%) were confirmed by IFA (1.5% positivity). 997 women with HBsAg (86.9%) were tested for HBe antigen, of these, 21 (2.1%) were positive by rapid tests and 10 (47.6%) were confirmed by IFA (1.0% positivity).

CONCLUSIONS:

The system represents Baku only and cannot be considered representative for Azerbaijan. The system does allow reliable detection of HBV among pregnant women. Educational activities on hepatitis risk in newborns need to be increased for expecting women, and the program needs to be expanded to all regions of the republic.

PRESENTED BY: DR KHANIM SALAHOVA

Keywords: Hepatitis B, newborn, HBIG, rapid test, IFA

ESCAIDE reference number: 20110061

TUBERCULOSIS AND RESPIRATORY DISEASES

Simultaneous TB and HIV diagnosis in CoRIS patients, in Spain

Vinciane Sizaire (1–2), S. Monge (3, 4), P. Miralles (5), J. Lacruz (6), S. Moreno (7), I. Santos (8), J. R. Blanco (9), G. Navarro (10), J. M. Miró (11), R. Rubio (12), V. Soriano (13), J. M. Peña (14), A. Hernando (12), B. Clotet (15), J. H. Quero (16)

AFFILIATIONS:

1. European Programme on Intervention Epidemiology Training (EPIET); 2. National Centre of Epidemiology, Carlos III Institute of Public Health, Madrid, SPAIN; 3. Red de Investigación en Sida, Centro Nacional de Epidemiología, Instituto de Salud Carlos III, Madrid, Spain.; 4. CIBER de Epidemiología y Salud Pública (CIBERESP); 5. H. General Universitario Gregorio Marañón, Madrid; 6. H. Universitario La Fe, Valencia; 7. H. Universitario Ramón y Cajal, Madrid; 8. H. Universitario La Princesa, Madrid; 9. H. San Pedro CIBIR, Logroño; 10. Corporación Sanitaria y Hospitalaria Parc Tauli, Sabadell; 11. H. Clinic Universitari, Barcelona; 12. H. Universitario Doce de Octubre, Madrid; 13. H. Carlos III, Madrid; 14. H. Universitario La Paz, Madrid; 15. H. Universitario Germans Trias i Pujol, Badalona; 16. H. Universitario San Cecilio, Granada; 17. H. Universitario Virgen de la Victoria, Málaga; 18. H. General Universitario de Alicante, Alicante; 19. Cohorte de la Red de Investigación en Sida

BACKGROUND:

We aim to evaluate the magnitude and the risk factors associated to the simultaneous diagnosis of tuberculosis (TB) and HIV in CoRIS, Spain, in order to improve the management of HIV/TB coinfection in Spain.

METHODS:

CoRIS is a multicenter, open prospective cohort study of HIV-positive older than 13 years, naïve to antiretroviral treatment (ART) at study entry. Cases were all subjects with a TB diagnosis (bacteriology confirmed and/or defined by the clinician), at entry or in the follow-up between 2004–2010. We defined simultaneous diagnosis as being diagnosed of both HIV and TB within one month. Adjusted relative risks by sex, age, country of origin and category of HIV transmission were calculated using binomial regression.

RESULTS:

Preliminary analysis on 118/320 cases of TB show that 41% had disseminated TB. Median age was 38 years (IQR=31-44), 77% were male, 50% were foreign-born, mainly Latin-Americans (18.6%) and Sub-Saharan Africans (17.8%). At TB diagnosis, the median CD4 count was 141 (IQR=59-286) and 25% of cases were on ART. Five out of 67 patients (7.5%) showed resistance to one or more anti-TB drugs. Forty-seven percent discovered their HIV status at the time of TB and this was more likely to be in foreign-born (RR=1.9, 95% CI=1.2-2.9) and patients infected by heterosexual contact (RR=1.56, 95% CI=1.0-2.3).

CONCLUSIONS:

The high proportion of patients who discover their HIV status simultaneously to TB, especially in foreign-born and in heterosexuals, explain the low median CD4 count and the high proportion of disseminated TB. This is likely to have a negative impact on long-term prognosis, requiring further investigation. We need also to identify the most affected subgroups such as Sub-Saharan Africans or Latin-Americans.

PRESENTED BY: DR VINCIANE SIZAIRE

Keywords: Tuberculosis, HIV cohort, HIV diagnosis, TB diagnosis

ESCAIDE reference number: 20110250

TUBERCULOSIS AND RESPIRATORY DISEASES

Identical toxigenic *Corynebacterium ulcerans* strain in a patient with diphtheria-like illness and her asymptomatic cat

Anja Berger (1, 2), Ingrid Huber (2), Sophie-Susann Merbecks (3), Ingrid Ehrhard (3), Regina Konrad (1, 2), Stefan Hörmansdorfer (2), Michael Hogardt (2, 4), and Andreas Sing (1, 2, 4)

AFFILIATIONS:

1. National Consiliary Laboratory for Diphtheria, Oberschleißheim, Germany
2. Bavarian Health and Food Safety Authority, Oberschleißheim, Germany
3. Public Health Laboratory of Saxony, Germany

BACKGROUND:

Diphtheria and diphtheria-like illness is caused by *Corynebacterium* species harbouring the diphtheria toxin (DT) encoding *tox* gene. In recent years, diphtheria-like infections with toxigenic *Corynebacterium ulcerans* have outnumbered those caused by toxigenic *C. diphtheriae* in many industrialized countries. Lately, *C. ulcerans* has increasingly been isolated from domestic animals such as pet dogs and cats. So far, isolation of an identical toxigenic *C. ulcerans* strain from an animal and its owner is documented only for dogs and a pig. Here we report the first case of proven transmission of a toxigenic *C. ulcerans* strain between a pet cat and a human causing pharyngeal diphtheria-like illness.

METHODS:

Toxigenic *Corynebacterium ulcerans* isolated from a 86-year-old patient with diphtheria-like illness and her asymptomatic cat were characterized by API Coryne, *rpoB* sequencing and MALDI-TOF analysis. Toxigenicity was verified by real-time PCR and a modified Elek test.

RESULTS:

Sequencing of *rpoB* and *tox* showed 100% homology between the human and the cat strains. Ribotyping revealing an U₃-like ribotype and multilocus sequence typing confirmed the clonal identity of human and animal strains.

CONCLUSIONS:

Our findings of a proven transmission of toxigenic *C. ulcerans* between a cat and her human owner underline the zoonotic potential of this organism and highlight the importance of further studies investigating the *Corynebacterium* carrier status of companion animals such as cats and dogs.

PRESENTED BY: DR ANDREAS SING

Keywords: Diphtheria, zoonosis, *corynebacterium ulcerans*

ESCAIDE reference number: 20110002

TUBERCULOSIS AND RESPIRATORY DISEASES

High Prevalence Of Subclinical Tuberculosis In HIV-1 Infected Persons Without Advanced Immunodeficiency in South Africa: Implications For TB Screening

Tolu ONI (1, 2), Rachael BURKE (3), Relebohile TSEKELA (1), Nonzwakazi BANGANI (1), Ronnett SELDON (1), Hannah P GIDEON (1), Kathryn WOOD (1), Katalin A WILKINSON (1, 4), Tom HM OTTENHOFF (5), Robert J WILKINSON (1, 2, 4)

AFFILIATIONS:

1. Institute of Infectious Diseases and Molecular Medicine, Faculty of Health Sciences, University of Cape Town, Observatory 7925, South Africa.
2. Division of Medicine, Imperial College London, W2 1PG, UK.
3. Department of Public Health, University of Oxford, Old Road Campus, Headington Oxford, OX3 7LF.
4. Medical Research Council, National Institute for Medical Research, Mill Hill, London, NW7 1AA, UK.
5. Leiden University Medical Center, Leiden, The Netherlands

BACKGROUND:

The prevalence of asymptomatic TB in antiretroviral therapy (ART)-naïve HIV-1-infected persons is not well described. It has been proposed that TB infection exists as a spectrum of responses from innate immune to active disease including a minimally symptomatic phase of infection during which patients nevertheless become infectious. However, it is unclear if detection of *M. tuberculosis* in these patients represents an early asymptomatic phase leading to progressive disease or transient excretion of bacilli. Our objective was to describe the prevalence and outcome of subclinical TB disease in pre-ART HIV-1-infected persons.

METHODS:

274 asymptomatic ART-naïve HIV-1-infected persons were recruited from a pre-ART clinic at Khayelitsha day hospital in an informal township, Cape Town.

RESULTS:

We found an 8.5% (95% C.I. 5.1-13.0%) prevalence of subclinical TB disease (n=18); 22% were smear-positive; 71% had normal chest X-rays. Spoligotyping showed a diverse variety of genotypes with all paired isolates being of the same spoligotype, excluding cross-contamination. Sixteen of the 18 were followed up; 9 developed symptoms 3 days to 2 months later. All were well and in care 6 to 12 months after TB diagnosis. A positive tuberculin skin test (TST) (OR 5, p= 0.064), low CD4 count (OR 0.996, p=0.06), and number of years post-HIV diagnosis (OR 0.95, p= 0.056) showed trends towards predicting TB disease in multivariate analysis.

CONCLUSIONS:

We describe a high prevalence, but good outcome (retained in care), of subclinical TB disease in HIV-1 infected persons, supporting the spectrum hypothesis of TB infection. Our results suggest that in high HIV/TB endemic settings, a positive HIV-1 test should prompt TB sputum culture irrespective of symptoms, particularly in those with a TST_≥5mm, longer history of HIV infection and low CD4 count.

PRESENTED BY: DR TOLU ONI

Keywords: *Mycobacterium tuberculosis*, HIV-1, sub-clinical tuberculosis, diagnosis, screening

ESCAIDE reference number: 20110005

POSTER SESSION ABSTRACTS

TUBERCULOSIS AND RESPIRATORY DISEASES

Tendency of tobacco smoking among tuberculosis patients in a big city

A. Orcau, JA Caylà, MJ Santomà, L. Curiel

AFFILIATIONS:

Epidemiology Service. Public Health Agency of Barcelona Spain

BACKGROUND:

There is consistent evidence that tobacco smoking (TS) is associated with an increased risk of tuberculosis (TB) and the percentage of TS among TB patients is higher than the observed in the general population. The objective is to study the evolution of the prevalence of TS among TB patients residents in Barcelona from 1988 to 2010.

METHODS:

All Spanish-born TB patients over 15 years old that began treatment during the study period with the TS status known and a successful treatment outcome were selected. The yearly percentage of TS and the linear tendency for trend were calculated in men and women. This tendency was compared with the evolution of TS in the general population.

RESULTS:

8983 TB cases were detected. 5985 were men (66,6%) and 2998 women (33,4%). In men, the prevalence of TS ranged from 60,7% in 1988 to 61 % in 2009–2010. The highest prevalence was 65,7% (2001–2003). In women, the prevalence ranged from 31,6% in 1988 to 38,7% in 2010. The linear tendency for trend was not statistically significant in both sexes ($p=0,85$ in men and $0,24$ in women). The prevalence of TS in male population decreased from 48% to 33% in the same period and in females increased from 18% to 21%.

CONCLUSIONS:

The prevalence of TS in men with TB in the city is maintained high over the time in contrast with the declining tendency in the male general population. The prevalence in women with TB is higher than those of general population. The length of the follow-up (6 months or more) until the outcome of TB could be used to introduce smoking cessation programmes in both genders.

PRESENTED BY: MS ÀNGELS ORCAU

Keywords: Tobacco smoking, tuberculosis, tendency

ESCAIDE reference number: 20110135

TUBERCULOSIS AND RESPIRATORY DISEASES

Multicentre study for assessment of the laboratory ability to detect enterovirus 68, an emerging respiratory pathogen

Giovanna Jaramillo-Gutierrez (1, 2), Kimberley Benschop (6), Arjan de Jong (5), Oscar Pontesili(4), S. D. Diepstraten-Pas (3) John Rossen (8), Caroline Swanink (10), Ann Vossen (9), Adri van der Zanden (7), Anton Van Loon (11), Steven Thijsen (12) Harrie va

AFFILIATIONS:

1. National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands 2. European Public Health Microbiology Training programme (EUPHEM), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden 3. Erasmus Medical Centre, Rotterdam, The Netherlands. 4. Maastad Hospital, Rotterdam, The Netherlands 5. University Medical Centre St Radboud, Nijmegen, The Netherlands 6. Academic Medical Centre, Amsterdam, The Netherlands 7. Laboratorium Microbiologie, Enschede, The Netherlands 8. St. Elisabeth Hospital, Tilburg, The Netherlands 9. Leiden University Medical Centre, Leiden, The Netherlands 10. Medical Microbiological and Immunological laboratory, Rijnstate Velp, The Netherlands 11. University Medical Center Utrecht, Utrecht, Netherlands 12. Diaconessenhuis Utrecht, Utrecht, The Netherlands.

BACKGROUND:

We detected an increased circulation (3-fold, $n=24$) compared to previous years since 1996 of enterovirus (EV) 68 during September and October 2010, through the general practitioner-based sentinel surveillance for acute respiratory infections. In 2010, EV68 was not detected through the clinical laboratory-based EV typing surveillance. Therefore, we performed a qualitative survey to assess the ability of clinical laboratories to detect EV68

METHODS:

Ten laboratories across the Netherlands that reported substantial numbers of EV and genetically related rhinovirus (RV) detections during fall 2010 were sent a questionnaire to assess the types of clinical specimen being tested and EV and RV PCR protocols being routinely used. Primer/probe sequences were analysed in silico for their match with EV68 sequences. Laboratories were asked to test a 10-fold serial dilution of a reference EV68 strain provided by Dutch National Public Health Institute (RIVM) with their current EV and RV PCR protocols.

RESULTS:

The in silico analysis indicated that despite some mismatches in primers/probes in theory the EV and RV PCRs should both be able to detect EV68. Indeed, all six out ten laboratories that tested the EV68 reference strain provided could detect EV68, although with varying analytical sensitivities, with their EV PCR. Four out six laboratories detected the reference strain with in their RV PCR as well.

CONCLUSIONS:

Cases of EV68 may have gone unnoticed due to not testing for EV of respiratory tract specimens from patients with respiratory disease as well as cross-reactivity in molecular diagnostics of rhinovirus and enterovirus. Careful evaluation of the routine diagnostics may help identify gaps in case ascertainment during the emergence of new or previously unrecognized pathogens.

PRESENTED BY: DR GIOVANNA JARAMILLO-GUTIERREZ

Keywords: Enterovirus D, Human; Enterovirus type 68; Upper respiratory tract infections; Molecular diagnostics

ESCAIDE reference number: 20110156

TUBERCULOSIS AND RESPIRATORY DISEASES

Tuberculosis Treatment Outcome Monitoring: how underlying definitions determine success rates – a review from a German perspective

Sofie Gillesberg Lassen (1, 2), Barbara Hauer (2), Bonita Brodhun (2), Lena Fiebig (2), Doris Altman (2), Walter Haas (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Robert Koch Institute (RKI), Dept. Infectious Disease Epidemiology, Berlin, Germany

BACKGROUND:

Treatment success rate (TSR) is the key indicator used in Treatment Outcome Monitoring (TOM) to compare quality and progress of tuberculosis (TB) control. In 1991, the TSR target was set by WHO to 85%; however, different definitions and denominators used to calculate TSR by WHO, ECDC and individual countries can lead to different results and conclusions. In Germany, the Robert Koch Institute (RKI) defines how TSR is calculated. In this study, we aimed to assess the differences in the definitions and denominators used by WHO, ECDC and RKI and implications for the TB TSR for Germany.

METHODS:

TOM definitions and denominators used by WHO, ECDC and RKI were identified by reviewing publicly available reference documents. Yearly TSRs were calculated according to all three approaches using the 2002–2008 German TB notification data, comprising a total of 42,286 TB cases. The resulting TSRs were compared using the chi-square test at the 5% significance level.

RESULTS:

We identified the following differences in defined TB patient groups for which TSR is calculated; WHO uses smear- and/or culture-positive new pulmonary TB cases as denominator (N=18,900 for Germany), ECDC refers to culture-positive new pulmonary TB cases (N=18,134), and the RKI includes all TB cases with treatment outcome reported (N=38,344). An overall TSR of 80.6% for the years 2002–2008 is found when applying the RKI definitions. This is statistically significantly ($P<0.001$) higher than the overall TSR when applying the WHO (75.7%) or ECDC (76.6%) definitions.

CONCLUSIONS:

Our study found that definitions and denominators used highly impact TB TSR. Universal definitions underlying TSR calculation are thus important, in particular when comparing treatment outcomes across countries. Regardless of definitions used, Germany does not reach the WHO target.

PRESENTED BY: MS SOFIE GILLESBERG LASSEN

Keywords: Tuberculosis, Surveillance, Treatment Outcome Monitoring, Treatment Success

ESCAIDE reference number: 20110157

TUBERCULOSIS AND RESPIRATORY DISEASES

The United Kingdom Tuberculosis Port of Entry Migrant Screening Programme: study on yields, screening tool validity and groups at increased risk for Tuberculosis among new entrants in 2009 and 2010

Ettore Severi (1, 2), Helen Maguire (3), Graham Bickler (1), Ibrahim Abubakar (4)

AFFILIATIONS:

1. Health Protection Agency, South East Region
2. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm
3. Health Protection Agency, London Regional Epidemiology Unit
4. Health Protection Agency, Respiratory Diseases Department – Tuberculosis Section

BACKGROUND:

Tuberculosis (TB) incidence in the UK increased in the last decade, especially among migrants. The UK Port Health TB screening service aims to reduce TB importation into the UK. New entrants at Heathrow and Gatwick airports intending to stay longer than six months, from high TB incidence countries and subject to immigration control, are screened by chest radiography. This study aims to evaluate Chest X-ray screening tool validity and yield, and identify possible risk groups to be prioritised for screening and follow up.

METHODS:

Information on new entrants screened between June 2009 and September 2010 was probabilistically matched with TB diagnoses from the Enhanced TB Surveillance (ETS) database from 01/06/2010 until 31/12/2010. Yield, sensitivity, specificity and predictive values of the screening test were calculated. Stratified analysis by nationality, immigration status, age and sex was also undertaken.

RESULTS:

Among 95,426 entrants screened at entry during the study period, a TB diagnosis was suspected in 560 entrants (0.59%). Among them, 76 persons (0.08%) were subsequently reported with TB on ETS, of whom, 51 (0.05%) were likely to have been diagnosed through screening, having been reported within three months of entry. Screening therefore detected 51 cases among 95,426 entrants (0.05%). The screening test has a Positive Predictive Value of 9.11%, sensitivity of 68.00% and specificity of 99.47%. Being a refugee ($p=0.03$) and origin from countries with TB incidence >150 cases per 105 per year ($p=0.04$) were found to be independently associated with increased likelihood of TB diagnosis.

CONCLUSIONS:

While the overall yield is low, these data suggest the prioritisation of migrants from countries with TB incidence >150 cases per 105 per year as well as refugees for post-entry screening.

PRESENTED BY: MR ETTORE SEVERI

Keywords: Tuberculosis; Immigration; Screening; Airports; United Kingdom

ESCAIDE reference number: 20110234

POSTER SESSION ABSTRACTS

TUBERCULOSIS AND RESPIRATORY DISEASES

Healthcare resources utilization in relation to patients suffering from prolonged cough, suspected of pertussis in Poland, 2009–2010

Ewa Karasek, Iwona Paradowska – Stankiewicz, Paweł Stefanoff

AFFILIATIONS:

National Institute of Public Health-National Institute of Hygiene, Department of Epidemiology, Warsaw, Poland

BACKGROUND:

Obligatory vaccination against pertussis in Poland since 1960 affected the perception of disease as eliminated, even among medical staff. Thus differential diagnosis for this disease is rarely done. High underreporting rate of pertussis observed in Poland constitute a ground to assume pertussis cases are misdiagnosed. The aim of the study was to determine diagnosis and treatment of patients with prolonged cough, enrolled in a prospective enhanced surveillance of pertussis, carried out in Poland during 2009–2010.

METHODS:

The enhanced surveillance study was conducted from July 2009, until September 2010 in the population served by 77 randomly selected GPs (158,596 persons). Inclusion criteria were: age >3 years, cough lasting 2–15 weeks, and informed consent. GPs interviewed each eligible patient by questionnaire containing questions on utilization of healthcare, diagnostic tests and prescribed medications starting from appearance of first symptoms to visit in GP.

RESULTS:

During the study period 845 patients met inclusion criteria, of which 558 (66%) used healthcare services. The number of visits per patient ranged from 1.56 to 3.08, depending on age. Out of 558 patients, 33 (4%) needed an ambulance help, 440 patients (52,1%) were referred for diagnostic tests, but not for Bordetella pertussis identification. Almost half (359 patients; 42,5%) used antibiotics, but only 198 (23,4%) received antibiotics effective for pertussis.

CONCLUSIONS:

Patients with unrecognized pertussis generate unnecessary costs related mostly to days off work and utilization of healthcare resources. Treatment focused on reducing symptoms, instead etiologic treatment, contribute to maintained Bordetella pertussis transmission in the society.

PRESENTED BY: MISS EWA KARASEK

Keywords: Pertussis, epidemiology, health care system

ESCAIDE reference number: 20110241

TUBERCULOSIS AND RESPIRATORY DISEASES

Post mortem diagnosis of tuberculosis in the European Union and European Economic Area, 2009

V. Hollo, Csaba Ködmön, Phillip Zucs

AFFILIATIONS:

European Centre for Disease Prevention and Control

BACKGROUND:

In most instances, the diagnosis of tuberculosis (TB) follows a clinical presentation of respiratory symptoms. However, some TB cases are diagnosed by autopsy as an accidental finding or after a suspect case is already deceased.

METHODS:

We extracted post mortem diagnosis (PMD) data from routine TB surveillance data that had been reported from European Union (EU) and European Economic Area (EEA) Member States to the European Surveillance System (TESSy) database in 2009. PMD cases were then compared to cases diagnosed ante mortem (AMD).

RESULTS:

Eighteen EU/EEA countries reported 369 PMD cases accounting for 0.7% of 55 669 cases reported by these countries. The country-specific proportions of PMD ranged from 0.1 to 9.7%. While the male to female ratios for PMD and AMD did not differ noticeably (1.90 versus 1.88), the median age of PMD cases was higher compared with AMD cases (64 versus 45 years, $p < 0.05$). The proportions of previously treated cases were 34 (9.2%) of 369 PMD cases and 8500 (15.5%) of 54724 AMD cases for which this information was available ($p = 0.0008$). Pulmonary TB was reported for 63.4% of PMD and 68.9% of AMD cases ($p = 0.02$). Multi-drug resistance (MDR) was reported for 2.5% of PMD and 6.5% of AMD cases ($p = 0.03$), probably due to a lower MDR prevalence in the age group over 65 years.

CONCLUSIONS:

PMD cases differ from AMD cases, most importantly in being older and having had less previous treatment. TB seems to be more likely to be overlooked in the elderly. The results need to be treated with caution, given the substantial differences in reporting practices between Member States.

PRESENTED BY: DR VAHUR HOLLO

Keywords: Post mortem diagnosis of tuberculosis in Europe

ESCAIDE reference number: 20110290

TUBERCULOSIS AND RESPIRATORY DISEASES

Mycobacterium tuberculosis isolates showed high degree of genetic diversity and association with drug resistance in Nepal

Bijaya Malla (1, 4), S. Borrell (1, 4), B. Shrestha (2), L. Fenner (3)
D. Stucki (1, 4), M. Ballif (1, 4) S. Gagnew (1, 4)

AFFILIATIONS:

1. Department of Medical Parasitology and Infection Biology, Swiss Tropical and Public Health Institute (Swiss TPH), Basel, Switzerland
2. German Nepal Tuberculosis Project, Kathmandu, Nepal
3. Institute of Social and Preventive Medicine, University of Bern, Switzerland
4. University of Basel, Switzerland

BACKGROUND:

The genotype specific association of *Mycobacterium tuberculosis* complex (MTBC) with drug resistance and patient clinical characteristics varies in different geography. We aimed to explore the MTBC genotypes and association with drug resistance, and BCG vaccination in low multi drug resistance prevalence, but high-disease incidence setting of Nepal.

METHODS:

The demographic and clinical data was obtained from tuberculosis patients representing various geographical origins of Nepal during 2009. Single nucleotide polymorphism (SNPs) was performed to define the phylogenetic lineages. *InhA*-promoter region, *katG*, *rpoB*, *gyrA*, and *rrs* were sequenced to determine drug resistances for isoniazid, rifampicin, fluoroquinolones, and aminoglycosides.

RESULTS:

The SNP typing of 184 MTBC isolates showed presence of four phylogenetically distinct lineages; East-African-Indian lineage (40.7%), East-Asian lineage (30.4%), Euro-American lineage (16.3%), and Indo-Oceanic lineage (12.5%). East-Asian Lineage (that includes "Beijing" Spoligotype family) compared to other lineages was found associated with any drug resistance (OR 2.8; 95%CI 1.2–6.1, $P=0.005$). East-Asian Lineage was not more frequent among BCG vaccinated patients compared to non-vaccinated patients (23 [41.1%] vs. 33[58.9%], $P=0.4$).

CONCLUSIONS:

The MTBC population structure is highly diverse in Nepal, driven by two major lineages. The association with drug resistance indicates that East-Asian lineage may have a selective advantage with drug resistance. We observed no evidence that BCG vaccination might have a selective factor for spread of East-Asian Lineage. Our findings suggest that strain diversity and differences in clinical characteristics differ in context of Nepal.

PRESENTED BY: MR BIJAYA MALLA

Keywords: Tuberculosis, drug resistance, vaccination, genotyping

ESCAIDE reference number: 20110325

VACCINATION: UPTAKE, COVERAGE AND EFFECTIVENESS

Immunogenicity of a hexavalent vaccine co-administered with 7-valent pneumococcal conjugate vaccine: Anti-HBs response lower than anticipated

Jane Whelan (1,2), S. Hahné (1), G. Berbers (1), F. van der Klis (1), Y. Wijnands (1), H Boot (1)

AFFILIATIONS:

1. Centre for Infectious Disease Control, National Institute for Public Health and Environment, (RIVM), P.O. Box 1, 3720 BA Bilthoven, The Netherlands.
2. European Programme for Interventional Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Tomtebodavägen 11A, SE-171 83 Stockholm Sweden.

BACKGROUND:

Infanrix-hexa™ (IH) vaccine, containing components against hepatitis B virus (HBV), diphtheria (D), tetanus (T), pertussis (Pa), poliomyelitis (IPV) and *Haemophilus influenzae* type b (Hib), was introduced into the national childhood vaccination schedule in the Netherlands in 2006. It is offered (concomitantly with pneumococcal vaccine, Prevenar™) to children at increased risk of hepatitis B, administered in a 4-dose schedule at age 2, 3, 4 and 11 months.. Other children are offered Infanrix™-IPV+Hib vaccine (without HBV) using the same schedule. Reduced HBV immunogenicity has been reported in other studies of combination vaccines and detailed assessment of their immunogenicity is advocated.

METHODS:

We assessed the immunogenicity of the HBV component of IH co-administered with Prevenar™ in children attending healthy baby clinics in 10 municipalities in the Netherlands. Pa and Hib components in IH were then compared with the standard Infanrix™-IPV+Hib vaccine (without HBV) administered to a control group.

RESULTS:

Target thresholds for immune responses were achieved for all antigens studied. >99% (163/164) of children vaccinated with IH achieved an adequate immune response (≥ 10 mIU/ml) to the HBV component. However, peak geometric mean anti-HBs concentration was 2264mIU/ml (95%CI:1850-2771mIU/ml), twofold lower than reported in other research. The GMC to pertussis component, filamentous hemagglutinin (FHA), of IH was lower in children vaccinated with IH and Prevenar than in children vaccinated with Infanrix-IPV+Hib.

CONCLUSIONS:

We provide a baseline GMC for HBV in IH in this at-risk group. Universal infant HBV vaccination using IH will be introduced in 2011. The clinical relevance of our finding that the anti-HBs titer was lower than expected is uncertain. Despite high rates of seroconversion, long term immunogenicity and effectiveness of the HBV component of Infanrix hexa should be monitored.

PRESENTED BY: DR JANE WHELAN

Keywords: Diphtheria-Tetanus-acellular Pertussis Vaccines; Hepatitis B Vaccines; Haemophilus Vaccines; Pneumococcal Vaccines; Immunogenicity; Infants

ESCAIDE reference number: 20110041

POSTER SESSION ABSTRACTS

VACCINATION: UPTAKE, COVERAGE AND EFFECTIVENESS

Knowledge and attitudes towards HPV vaccine among females in Western Greece

Eleni Jelastopulu (1), P. Plotas (1), N. Kostopoulos (2), G. Tsiros (1, 3), K. Poulas (2)

AFFILIATIONS:

1. Department of Public Health, School of Medicine, University of Patras, Greece
2. Department of Pharmaceutical Marketing, School of Pharmacy, University of Patras, Greece
3. Rural Medical Dispensary of Chavari, Health Center of Gastouni, Greece

BACKGROUND:

Cervical cancer is one of the most frequent cancer in women with an estimated 54,000 new cases and 25,000 deaths in 2008 for the entire Europe (Arbyn 2011). The risk of developing cervical cancer is mainly related to the Human papillomavirus (HPV) infection and for a short time there are in addition to effective screening methods prophylactic vaccines available. The purpose of this study was to assess the knowledge and attitudes towards Papanicolaou testing, HPV infection and vaccination, and cervical cancer among females in two cities of Western Greece.

METHODS:

A cross-sectional study was conducted in 2010 among 450 women, who visited practices of various physicians and pharmacies in Pirgos and Patras. Demographic and socioeconomic data were recorded and their attitudes and knowledge related to cervical cancer development and prevention.

RESULTS:

Knowledge of cervical screening was very high (99.6%), whereas knowledge of HPV and mode of transmission was low (24.5% and 10.4%, respectively). However, 91% were informed about the HPV vaccine and 84.2% professed an intention to receive the vaccine. The majority of women (95.4%) would allow their daughter to be vaccinated, but only 15.4% their son, respectively. A relative high percentage (42%) believe the gynecologists are not good enough informed about HPV and its links with cervical cancer and 97% expressed their wish of more and better information and health education in regard of cervical cancer and possible preventive measures in the schools.

CONCLUSIONS:

Knowledge and acceptance of HPV vaccination in the studied population are favourable. However, knowledge levels about HPV infection and mode of transmission are poor, thus health education in school, media and health professional promotion are required to raise awareness.

PRESENTED BY: DR ELENI JELASTOPULU

Keywords: Cervical cancer, HPV vaccine, screening, test Papanicolaou, Greece

ESCAIDE reference number: 20110044

VACCINATION: UPTAKE, COVERAGE AND EFFECTIVENESS

The outbreak of measles in Bulgaria (2009–2010) – a challenge during the elimination period or an expected situation?

Zefira Mihneva, L. Marinova, N. Gatcheva

AFFILIATIONS:

National Centre of Infectious and Parasitic Diseases, Sofia, Bulgaria

BACKGROUND:

Measles morbidity in Bulgaria has been below 1 per 100 000 population for more 10 years. The last indigenous cases were reported in 2001. According to the National Elimination Plan, 2005–2010 a countrywide intensification of fever and rash illness surveillance (through case-based reporting and laboratory confirmation) was adopted to meet WHO recommendations. Following an 8-year inter-epidemic period and zero cases reported in 2002–2004; five importations of measles were confirmed in the country during 2005–2009. The last case – Roma ethnic man, classified as imported caused at first a family cluster of imported-related cases and subsequently one of the largest outbreaks of measles in Europe.

METHODS:

The official data from the National Surveillance System for communicable and vaccine-preventable diseases were used. Case-based reported data for 24 253 affected by measles, registered in the period from April, 2009 to December, 2010 were analyzed by epidemiological, clinical and laboratory indicators. IgM and IgG ELISA tests for serological confirmation of the clinical cases and for studying immunological structure were used too. RT-PCR was utilized for measles virus genotyping.

RESULTS:

The shown data concern the parameters of epidemic process and vaccination coverage with 2 doses of MMR. Clinical complications (34.4%), incomplete immunization status of diseased (95%) and laboratory confirmed cases (16.2%) were analyzed. Proportion of susceptible to measles persons among population and health care workers as risk groups were discussed. Circulating measles virus genotype was detected as D4-Hamburg.

CONCLUSIONS:

The main risk factors for measles outbreak were: vaccine coverage with two doses MMR lower than the recommended by WHO; proportion of susceptible to measles persons exceeding the WHO susceptibility targets for the respective age groups; concentration of susceptible to measles persons in some sub-population groups.

PRESENTED BY: DR ZEFIRA MIHNEVA

Keywords: Measles, outbreak, elimination, WHO, target

ESCAIDE reference number: 20110201

VACCINATION: UPTAKE, COVERAGE AND EFFECTIVENESS

Synchronized polio supplementary immunization activities in the central Asian republics, Azerbaijan and the Russian Federation

Sergei Deshevoi, Rebecca Martin, Robb Butler, Dragan Jankovic, Shahin Huseynov, Chinara Aidralieva

AFFILIATIONS:

World Health Organization, WHO Regional Office for Europe

BACKGROUND:

In 2010, the WHO European Region experienced the first importation of wild poliovirus into the Region since it was certified as polio-free in 2002. Tajikistan reported 457 laboratory confirmed cases of wild poliovirus type 1. The virus also spread to neighboring countries, with cases reported in the Russian Federation (14), Turkmenistan (3) and Kazakhstan (1). At least 20 nationwide and subnational rounds of supplementary immunization activities (SIAs) with oral polio vaccines (OPV) were conducted in affected and high-risk countries to interrupt and prevent further spread of the outbreak.

METHODS:

In April-May 2011, two additional rounds of national or subnational SIAs in the most vulnerable population groups (aged 0–5, 0–15 years) were conducted to address any remaining population immunity gaps. For the first time since Operation MECACAR (1995–2007), seven countries conducted synchronized SIAs: Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan conducted two rounds each with trivalent OPV (tOPV); Kazakhstan and the Russian Federation conducted two rounds of subnational SIAs with monovalent OPV type 1 (mOPV1) and tOPV to halt transmission of wild poliovirus in high-risk territories. Lastly, Azerbaijan implemented two rounds with tOPV in districts bordering the Russian Federation.

RESULTS:

In total, more than 18 million children were reached with polio vaccines in 15 rounds of SIAs. High administrative coverage was reported and confirmed by independent monitoring uniformly conducted in Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan

CONCLUSIONS:

The high quality rounds of synchronized SIAs should close any remaining population immunity gaps in the countries affected by the 2010 outbreak. However, all countries in the WHO European Region remain at risk of importation of wild poliovirus but can prevent spread through sensitive surveillance and effective national preparedness plans.

PRESENTED BY: DR SERGEI DESHEVOI

Keywords: Poliomyelitis; Poliovirus; Poliovirus Vaccine, Oral; Immunization; Outbreaks

ESCAIDE reference number: 20110203

VACCINATION: UPTAKE, COVERAGE AND EFFECTIVENESS

Mumps vaccine uptake among non or incomplete vaccinated students during an outbreak in the Netherlands

C. M. Swaan (1), B. Wolters (2)

AFFILIATIONS:

1. Preparedness and Response Unit (LCI), Centre for Infectious Disease Control, National Institute for Public Health and the Environment (RIVM), Bilthoven, the Netherlands
2. Municipal Health Service, GGD Groningen, Groningen, the Netherlands

BACKGROUND:

Since December 2009, a mumps outbreak started among mainly vaccinated university students in the Netherlands. Municipal Health Services (MHS) were advised to offer catch-up mumps-measles-rubella (MMR) vaccination to non or incomplete (one MMR) vaccinated students, estimated 5–10% of the student population. Vaccine uptake was expected to improve when offered nearby student locations and for low price. As MHS's consistently reported low uptake, an investigation was initiated into the vaccine uptake in 2010, vaccination sites and costs, among MHS's with universities in their region.

METHODS:

Questionnaires were sent to 13 MHS, to collect data on the number of students vaccinated among in total 175,000 university students over 2010, the location where vaccination was offered, and price. Relations between vaccine uptake and location and price were analyzed.

RESULTS:

All MHS responded. At 11 out of 14 universities, catch-up vaccination was offered. In total 635 students were vaccinated. Vaccine uptake was low, 5.5% (range 3.6–7.3%) of non or incomplete vaccinated students. The uptake of all students varied between 0.02% and 1.89% among the 11 universities. The price varied between 0 and 40 Euro. Four MHS offered vaccination at or close to student sites. Uptake was not related to price or vaccination site ($p=0.20$ and 0.93 respectively, Spearman test).

CONCLUSIONS:

Although a wide spread mumps epidemic occurred among university students in the Netherlands, their catch-up vaccination uptake was low and not related to accessibility factors as vaccination price or distance. For the national outbreak management team, this low compliance formed an important reason not to offer a general booster vaccination to all students to stop the epidemic. Further research into determinants for mumps vaccine uptake among students is initiated.

PRESENTED BY: MRS CORIEN SWAAN

Keywords: Mumps outbreak, vaccination uptake, MMR

ESCAIDE reference number: 20110207

POSTER SESSION ABSTRACTS

VACCINATION: UPTAKE, COVERAGE AND EFFECTIVENESS

Knowledge and attitude related to human Papillomavirus vaccine uptake among 10th grade students in Berlin, Germany 2010

Petra Stöcker (1, 2)*, M. Dehnert (2), O. Wichmann (2), M. Schuster (2), Y. Deleré (2)

AFFILIATIONS:

1. Postgraduate Training for Applied Epidemiology (PAE, German FETP) and European Programme for Intervention Epidemiology Training (EPIET)
2. Robert Koch Institute, Department for Infectious Disease Epidemiology, Berlin, Germany

BACKGROUND:

Persisting human papilloma virus (HPV) infections, especially with HPV high-risk types 16 or 18, are prerequisites for cervical cancer. Since March 2007, the German Standing Committee on Vaccination recommends HPV vaccination for all 12–17 year-old females. We aimed at assessing vaccination coverage and knowledge among students in Berlin to identify factors influencing HPV-vaccine uptake.

METHODS:

We distributed self-administered questionnaires to 10th grade school students in 14 participating schools in Berlin. All school types (higher- and lower-level) were included. The questionnaire asked for socio-demographic characteristics, knowledge and statements on vaccinations. Additionally, we reviewed vaccination records. We applied multivariable statistical methods to identify independent predictors for HPV-vaccine uptake of female participants.

RESULTS:

Between September and December 2010, 442 students completed the questionnaire (mean age 15.1; range 14–19). In total 281/442 (63.6%) students specified HPV correctly as a sexually transmitted infection. Of 238 participating girls, 161 (67.6%) provided their vaccination records. Among these, 66 (41.0%) had received the required three HPV-vaccine doses. Reasons for being HPV unvaccinated were given by 65 girls (multiple choice): 26 (40.2%) indicated dissuasion from parents, 12 (18.5%) reported dissuasion from physicians. 20 girls (30.8%) had concerns about side-effects. Vaccine uptake increased with year of age (Odds Ratio (OR) 2.19, 95% Confidence Interval (CI) 1.16-4.15) and decreased with negative attitude towards vaccinations (OR=0.33, 95%CI 0.13-0.84).

CONCLUSIONS:

HPV-vaccine uptake is low among school girls in Berlin. Both, physicians and parents are influential regarding decision of adolescents for HPV vaccine uptake even though personal perceptions play a role on HPV vaccine decision. School vaccination programs could be beneficial to improve knowledge related to HPV and vaccines, and to offer low-barrier access to vaccination.

PRESENTED BY: MISS PETRA STÖCKER

Keywords: Human papilloma virus, vaccination coverage, knowledge, students

ESCAIDE reference number: 20110231

VACCINATION: UPTAKE, COVERAGE AND EFFECTIVENESS

Influenza vaccine effectiveness 2010–11 in Portugal obtained by two methods: results from the EuroEVA study

Ausenda Machado (1), B. Nunes (1), P. Pechirra (2), P. Gonçalves (2), P. Conde (2), R. Guiomar (2), I. Falcão (3)

AFFILIATIONS:

1. Departamento de Epidemiologia, Instituto Nacional de Saúde Dr Ricardo Jorge, Lisbon, Portugal
2. Laboratório Nacional de Referência para o Vírus da Gripe, Instituto Nacional de Saúde Dr. Ricardo Jorge, Lisbon, Portugal
3. Direcção-Geral da Saúde, Lisbon, Portugal

BACKGROUND:

Every year the influenza vaccine is reformulated so estimating the influenza vaccine effectiveness (VE) every season and in an early stage is important to support public health decisions. Since 2008, Portugal has been participating in the I-MOVE (Influenza Monitoring Vaccine Effectiveness in Europe) project with the EuroEVA study, which main objective is to estimate seasonal and pandemic vaccine effectiveness during and after the influenza season. In this context, we used two methods to estimate VE for the 2010–11 seasonal influenza vaccine, both in the elderly and in all age groups.

METHODS:

Two approaches were used to estimate VE: the Test Negative Design (TND) and the Screening method (SM). For TND, laboratory-confirmed influenza cases (ILI+) were compared to laboratory-negative influenza ILI patients (ILI-). ILI cases were selected by general practitioners using systematic sampling. For SM, the vaccine coverage (VC) on the ILI+ cases (recruited from the TND) was compared to the VC estimated in the general population using a telephone survey (ECOS).

RESULTS:

Overall results obtained by the EuroEVA study indicate that crude 2010–11 seasonal VE estimate was 79% (CI95% 43-94) and 70% (CI95% 32-87) for the TND and SM, respectively. After adjustment, the respective VE estimates decreased: 58 (CI95% -61-89) and 64% (CI95% 17-84).

CONCLUSIONS:

VE point estimates obtained by the two methods were very similar and an explanation for this consistency could be that the seasonal vaccine coverage estimates between ILI- (17.4%) and the population based telephone survey (17.5%) were also very close. Nevertheless, and due to small sample size, our study was unable to estimate VE for specific seasonal vaccine target groups. Further efforts should be done to increase sample size, mainly in the elderly population.

PRESENTED BY: MISS AUSENDA MACHADO

Keywords: Influenza vaccine, effectiveness, Test negative design, Screening method

ESCAIDE reference number: 20110247

VACCINATION: UPTAKE, COVERAGE AND EFFECTIVENESS

Monitoring web pages from Slovakia regarding vaccination

Lukas Murajda, Katarina Janosikova, Henrieta Hudeckova

AFFILIATIONS:

Department of Public Health, Jessenius Faculty of Medicine, Comenius University, Martin, Slovakia

BACKGROUND:

There are many anti-vaccination activities in European countries. Internet has a growing influence on health-related behaviour. Our aim was to monitor and analyze content of web pages from Slovakia regarding vaccination.

METHODS:

We performed a systematic survey of web pages from Slovakia. We included only web pages with a possibility to track the owner or author. We prepared a reference list of all relevant with details on author and content.

RESULTS:

During October-November 2010 we retrieved 80.000 hits on vaccination from web pages from Slovakia. We assessed 2.700 of them and 94 matched the inclusion criteria. From these, 39 pages were further excluded because they were e-shop sites, they did not meet the inclusion criteria fully or did not exist anymore. Out of 55 web pages, 46 (84%) had positive attitude to vaccination and 9 (16%) had negative attitude. Among positive, 6 (13%) were published by professional societies, 5 (11%) by healthcare facilities, 16 (35%) by state health authorities, 8 (17%) by pharmaceutical and other business companies, 1 (2%) by scientific institution, 7 (15%) by civil organisations and 3 (7%) by individuals (blogs). Among negative, 6 (32%) used ethical arguments, 1 (5%) moral/ religious arguments, 5 (26%) questioned effectiveness issues and 7 (37%) safety concerns.

CONCLUSIONS:

Most web pages from Slovakia present a positive attitude to vaccines and vaccination. They are mainly official health authorities (Ministry of Health, public health authorities and other) or pharmaceutical or business companies. Reasons to oppose vaccination are mostly based on safety concerns and ethical opinions. We find monitoring of Internet-based information necessary for health communication and plan to revise our findings yearly.

PRESENTED BY: MR LUKAS MURAJDA

Keywords: Vaccination, Internet, Slovakia, health communication

ESCAIDE reference number: 20110305

VACCINATION: UPTAKE, COVERAGE AND EFFECTIVENESS

Modelling mass vaccination programmes for varicella in Europe and its impact on zoster epidemiology

Piero Poletti (1), P. Manfredi (2), S. Merler (1), A. Melegaro (3), M. Ajelli (1), G. Scalia Tomba (4)

AFFILIATIONS:

1. Bruno Kessler Foundation, Trento, Italy
2. Department of Statistics and Mathematics Applied to Economics, University of Pisa, Pisa, Italy
3. DONDENA Centre for Research on Social Dynamics, Bocconi University, Milan, Italy
4. Department of Mathematics, University of 'Tor Vergata', Roma, Italy,

BACKGROUND:

The possible introduction of mass immunization against varicella in Europe is currently widely debated, due to the unknown impact of the vaccination on the epidemiology of zoster.

METHODS:

In order to investigate the transmission dynamics and control of varicella and zoster in different European countries, we use age-structured mathematical models, considering different assumptions on the process of zoster development. The transmission is estimated first by recently collected data on contact patterns and varicella serological data in some European countries. Second, the process leading to the development of zoster after the first varicella infection is estimated conditionally on transmission, by using available European data on age-specific zoster incidence. Finally we perform an extensive sensitivity analysis of those outputs related to the impact of immunization programmes which are of interest for the public health policy maker.

RESULTS:

We are able to accurately reproduce both observed varicella seroprevalence by age and incidence of zoster. We show that the issue of the lack of identifiability of the main intermediate parameters, i.e. rates of development of zoster susceptibility, of boosting, and zoster disease, is critical. However, we clearly identify which are the sources of major uncertainty in the predictions of the impact of immunization programmes, and consequently which model predictions are robust, despite the current limited knowledge on mechanisms underlying zoster development.

CONCLUSIONS:

This work has used uncertainty analyses techniques to identify robust inferences on the impact of VZV vaccination programmes. Even though acquiring further and new data remains an urgent need, we believe that the present work clearly contributes to identify which are the priorities of future efforts in data collection.

PRESENTED BY: MR PIERO POLETTI

Keywords: Chikempox, mathematical model, VZV, varicella, vaccination

ESCAIDE reference number: 20110334

POSTER SESSION ABSTRACTS

VACCINATION: UPTAKE, COVERAGE AND EFFECTIVENESS

Trends in vaccine-induced immunity to hepatitis B infection among medical personnel of an oncology center

Delia Herghea (1), A. Irimie (2, 3), M. Moisesescu-Goia (4)

AFFILIATIONS:

1. Infection Control Department, Oncology Institute "Ion Chiricuta", Cluj-Napoca, Romania
2. Surgical Department, Oncology Institute "Ion Chiricuta", Cluj-Napoca, Romania
3. University of Medicine and Pharmacy "Iuliu Hatieganu", Cluj-Napoca, Romania
4. Public Health Department of Cluj County, Romania

BACKGROUND:

In Romania, recombinant hepatitis B vaccine for health care workers is available since 1995. This study estimates vaccine-induced immunity to hepatitis B virus (HBV) infection among medical personnel of the Oncology Institute "Ion Chiricuta", a tertiary care center.

METHODS:

This study was conducted between 2008 and 2010 and included previously vaccinated medical personnel involved in occupational exposures to blood borne pathogens. Vaccine-induced immunity was identified by blood test results of anti-HBc negative and anti-HBs positive (>10 mIU/ml).

RESULTS:

Of the 62 participants included in this study, the overall proportion of those with vaccine-induced immunity to HBV was 85.5%. All the subjects were completely immunized (three doses at 0, 1 and 6 months). In the protected group ($n=53$; 85.5%) mean age at vaccination was 29.5 ± 6.9 years (19–47), mean time from vaccination was 6.8 ± 3.8 years (0.5–14.5) and mean anti-HBs titre was 252.2 ± 186.9 mIU/ml (11–592.8). In the nonprotected group ($n=9$; 14.5%) mean age at vaccination was 30.7 ± 9.5 years (20–50), mean time from vaccination was 8.9 ± 4.3 years (2.5–14) and mean anti-HBs titre was 2.3 ± 0.7 mIU/ml (2–4). There were no significant differences regarding sex ($p=0.61$), occupation ($p=0.56$), age at vaccination ($p=0.64$) and time since vaccination ($p=0.14$) between the two compared groups. The anti-HBs titre decrease significantly with time post-vaccination: 353.7 ± 222.6 mIU/ml at 1–5 years, 167.1 ± 147.1 mIU/ml at 6–10 years and 121.6 ± 119.9 mIU/ml over 10 year period ($p<0.001$).

CONCLUSIONS:

Vaccination programme against hepatitis B for medical personnel of the Oncology Institute "Ion Chiricuta" was safe and effective. Despite the decrease of the vaccine-induced immunity with time, the anti-HBs level remains protective for at least 10 years post-vaccination. Periodic anti-HBs monitoring is essential to detect nonprotective titer levels in medical personnel previously vaccinated.

PRESENTED BY: DR DELIA HERGHEA

Keywords: Vaccine-induced immunity, HBV

ESCAIDE reference number: 20110353

VACCINE PREVENTABLE DISEASES

A mixed outbreak of rubeola-rubella in District Kangra of Northern India

GuptaSN (1), Gupta Naveen (2), Neki NS (3)

AFFILIATIONS:

1. Epidemiologist cum Faculty, Regional Health and Family Welfare Training Centre, Chheeb, Kangra, Himachal Pradesh, India
2. Freelance researcher in Epidemiology, Kangra, Himachal Pradesh, India
3. Professor, Department of Medicine, Government Medical College, Amritsar-Panjab

BACKGROUND:

On 14th September 2006, a local community leader informed us about sudden increase in number of cases of fever and rash in five villages of district Kangra. We investigated the suspected outbreak to confirm diagnosis and recommend for prevention and control.

METHODS:

We defined a case of rubeola as occurrence of fever with rash in a child between from 3rd September to 13th January, 2007. We collected information on age, sex, date of onset, residence, signs, symptoms, vaccination and cold chain status. We described the outbreak by place, time and person characteristics. We conducted a retrospective cohort study to estimate vaccine efficacy. We ascertained the measles immunization status by interviewing the mothers and reviewing immunization cards. We confirmed diagnosis clinically, epidemiologically and serologically.

RESULTS:

We identified sixty case patients in five villages (41/60 rubeola and 11/60 confirmed epidemiologically linked unvaccinated rubella). The overall attack rate (AR) was 9%. Sex specific AR was 11% for male. Majorities of cases were >5 years of age. No death/minimal complications occurred. Of 60 case-patients, 42 (70%) were vaccinated for rubeola. The AR of rubeola among unvaccinated children was 25.8% as compared to AR among vaccinated of 4.5% (Relative risk: 5.75%; 95% confidence interval: 3.48–9.51 $P<0.001$). We estimated general vaccine efficacy (VE) to be 83% while gender based VE for male was 84%. Eight case-patients were confirmed serologically for measles IgM antibodies, two nasopharyngeal swabs positive by PCR. Rubeola virus was genotyped D4.

CONCLUSIONS:

A mixed outbreak of rubeola/rubella was confirmed clinically, epidemiologically and serologically. We recommend MR vaccination at the age of 18–24 months and aggressive IEC activities to modify help seeking behavior of affected areas.

PRESENTED BY: DR SURENDER GUPTA

Keywords: Rubeola-rubella outbreak, IgM antibodies, highly immunized villages, D4- genotype, Kangra

ESCAIDE reference number: 20110015

VACCINE PREVENTABLE DISEASES

Epidemiological investigation of mixed outbreaks of measles/varicella in hilly villages of district Kangra, Himachal Pradesh, India, 2007

Gupta SN (1), Gupta NN (2)

AFFILIATIONS:

1. MAE-FETP Graduate from NIE, Chennai; presently Epidemiologist at Regional Health and Family Welfare Training Centre, Chheb, Kangra, Himachal Pradesh, India.
2. Freelance researcher in Epidemiology, Kangra.

BACKGROUND:

On 26th September 2006, a local health worker informed us about sudden increased number of cases of febrile rash in three villages of district Kangra. We investigated the suspected outbreak to confirm diagnosis and recommendation to prevent and control.

METHODS:

A case measles was defined as occurrence of fever with rash in a child between six months to 17 years of age, from 26th September to 2nd week of January, 2007. The information on age, sex, symptoms, signs, date of onset, residence, traveling history, treatment taken and assessment of cold chain system was collected. The outbreak was described by place, time and person characteristics. We also conducted a retrospective cohort study among children between 10 months and 15 years of age to estimate the vaccine efficacy. We confirmed diagnosis clinically, epidemiologically and serologically.

RESULTS:

We identified 29/35 measles and 6/35 confirmed epidemiologically linked unvaccinated chickenpox case patients. The overall attack rate (AR) was 8.13%; maximally in the age group of 11–17 years ranging in between 17–35%. Sex specific AR was more (17%) in females. There was neither any death nor any serious complications. The proportion of the children vaccinated was 95% for measles but nil for varicella. Of 35 case-patients, 27 (78%) were vaccinated for measles only with no vitamin A supplementation. (Relative risk: 5.3; 95% confidence interval: 1.90 – 14.77). The measles vaccine efficacy was estimated to be 82%. 3/3 case-patients for measles IgM antibodies and 2/3 nasopharyngeal swabs were tested positive by PCR and D4 measles strain genotyped.

CONCLUSIONS:

Measles/varicella outbreaks were confirmed. We recommended varicella vaccination, second dose opportunity for measles and vitamin A supplementation to all cases in affected areas.

PRESENTED BY: DR SURENDER GUPTA

Keywords: Double infection, Measles, varicella, outbreak, IgM antibodies

ESCAIDE reference number: 20110017

VACCINE PREVENTABLE DISEASES

Is diphtheria re-emerging? The French point of view

Emmanuel Belchior, I. Bonmarin, D. Antona, D. Lévy-Bruhl

AFFILIATIONS:

French institute for public health surveillance (InVS), Saint-Maurice, France

BACKGROUND:

Thanks to very high vaccination coverage in infancy, diphtheria had almost disappeared in France. No cases had been notified between 1990 and 2001.

METHODS:

The case definition, used for mandatory notification, was expanded in 2003 and 2010 to include toxigenic strains of *Corynebacterium ulcerans* and *Corynebacterium pseudotuberculosis* respectively. We describe the epidemiology of diphtheria in France since the last indigenous case in 1989.

RESULTS:

From 2002 to 2010, 22 cases have been reported: 4 cases due to *Corynebacterium diphtheriae* related to exposure in endemic countries and 18 cases due to *C. ulcerans*, including 6 cases of pseudomembranous pharyngitis, probably related to contact with domestic animals. From January to May 2011, 4 cases have been reported: 1 case with a cutaneous ulceration due to *C. ulcerans*, related to a contact with a dog and 3 cases due to *C. diphtheriae*, one with a cutaneous ulceration related to exposure in an endemic country and 2 epidemiologically linked cases having travelled together in a non endemic area in Europe (an asymptomatic carrier and a case with a pseudomembranous pharyngitis).

CONCLUSIONS:

It is the first time since the 1980s that a possible transmission chain is described in France. Although a large part of the increase in incidence is attributable to the 2003 change in the case definition, those data show the persistence of a continuous risk of re-introduction of diphtheria in France. High booster vaccination coverage in the adult population and clinical awareness for clinicians, regarding the possible diagnosis of diphtheria even in the absence of recent travel in an endemic area, are needed. The greatest challenges may be to maintain microbiological skills and sensitive surveillance systems among all EU Member States.

PRESENTED BY: MR EMMANUEL BELCHIOR

Keywords: Diphtheria, epidemiology, France, re-emerging infectious disease, surveillance

ESCAIDE reference number: 20110030

POSTER SESSION ABSTRACTS

VACCINE PREVENTABLE DISEASES

Measles in London and the South East of England – what can we learn from the returning epidemic?

Dr Dominik Zenner, Ms Chantil Sinclair, Dr Sooria Balasegaram

AFFILIATIONS:

Health Protection Agency, UK London and South East of England Epidemiology Units

BACKGROUND:

Despite steadily improving immunisation rates, UK measles cases started to rise in 2011 after a period of low epidemic activity. The aim of this study was to describe the epidemiology of measles in London and South East regions in 2011 and compare it to 2010 to elicit changes in epidemiology, such as changes in setting for likely transmission or increased travel, which may explain recent increases and help targeted public health action.

METHODS:

All measles cases resident in London and South East regions notified through the UK notification system between January and April 2011 were analysed and compared with cases of the same period in 2010. Cases were extracted from the national case management system, cross-referenced with national surveillance data, described and analysed using STATA 11.

RESULTS:

Between January and April 2011, 568 measles cases were notified. The number of notifications more than doubled since 2010 ($n=272$). The number (211 vs. 19) and proportions (37% vs. 7%, $p<0.0001$) of confirmed cases were higher than 2010. The median age was 11 years (range 0–52), older than 2010 (median 2, $p<0.0001$). The proportion of vaccinated cases was higher in 2011 (17% vs. 0%), non-travel related cases were more common (69.2% vs. 0%, $p=0.001$) and there were more recorded community transmissions in 2011 compared to 2010 (14% vs. 6%). Thirty confirmed cases were associated with nine outbreaks in 2011 with no outbreaks reported in 2010.

CONCLUSIONS:

The increased number and proportion of confirmed cases demonstrates renewed epidemic activity. Our observations suggest extended sporadic community transmission across social networks particularly amongst children in older age groups. Information and vaccination campaigns should be more targeted to reduce transmission.

PRESENTED BY: DR DOMINIK ZENNER

Keywords: Measles, MMR vaccine, infectious disease transmission, epidemiology

ESCAIDE reference number: 20110082

VACCINE PREVENTABLE DISEASES

Mumps in Spain 2008–2010

Elga Mayo Montero (1), Josefa Masa Calles (2), Monserrat Terrés Arellano (2), Fernando Simon Soria (1, 2)

AFFILIATIONS:

1. Spanish Field Epidemiology Training Program. (PEAC), Madrid, SPAIN
2. National Centre of Epidemiology, Carlos III Institute of Public Health, Madrid, SPAIN.

BACKGROUND:

Mumps is an usually mild preventable epidemic viral disease requiring sometimes hospitalization. Despite MMR high vaccination rates of vaccine achieved since 1999 in Spain, resurgences of mumps in vaccinated populations have been described. This study gives a comprehensive overview of mumps in Spain in order to identify further lines of research related to reduce of mumps incidence.

METHODS:

We analysed data of numeric cases and outbreaks of mumps (2008–2010) reported to the National Notifiable Diseases Surveillance System. Also hospitalizations discharges diagnosed as mumps (ICD-9-CM codes: 072.0 to 072.9) were analyzed.

RESULTS:

A total of 8,225 cases of mumps were notified in Spain in 2008–2010. Estimated national incidence was 8.03/100,000 in 2008, 4.45/100,000 in 2009 and 5.49/100,000 in 2010. Highest incidence was observed among 10–14 years (31.36/100,000) in 2008 and among 1–4 years (21.44/100,000) in 2009. A higher proportion of male cases were observed. The 32.8 % and 18.6% of those with vaccination status was known had received two and one doses MMR respectively. Schools or households with children reported the 80% of mumps outbreaks in this period. Hospitals notified 237 hospitalizations with diagnosis of mumps, the 11.4% of these hospitalizations had collected a diagnostic code of mumps with complications. Most commons complications were orchitis (10), meningitis (6) and encephalitis (5).

CONCLUSIONS:

Adolescents and children have been the most affected age-group. A large proportion of cases were vaccinated. Better information collection about MMR vaccination status of cases is needed to improve the quality of our epidemiological investigation. In order to propose changes in existing vaccine policies to reduce mumps incidence and its complications a comprehensive assessment of mumps cases is needed

PRESENTED BY: MRS ELGA MAYO-MONTERO

Keywords: Mumps, MMR vaccine, mumps vaccine

ESCAIDE reference number: 20110100

VACCINE PREVENTABLE DISEASES

2011: Measles reaches Barcelona

Sarah Lafuente (1) M.J. Santoma (1), P.Simon (1), J.Costa (2), J. Caylà (1)

AFFILIATIONS:

1. Epidemiology Department, Public Health Agency of Barcelona
2. Hospital Clínic de Barcelona, Barcelona, Spain

BACKGROUND:

European countries are now committed to eliminate measles by 2015. However, 2010 was the year with the highest number of measles cases reported in Europe in more than 10 years [>30.000].

METHODS:

All suspected measles are urgently notified to our Department where an epidemiological survey is completed. Cases are classified into confirmed [positive IgM or PCR or linked to a confirmed case] or suspected [positive clinical definition without confirmation].

RESULTS:

Between 1st December 2010 until 30th June 2011, 159 measles cases have been notified, 28 have been discharged. 92 have been confirmed and 39 have been classified as suspected. 66 of the cases were female and 31% them [41] required hospital admission. Age distribution was as follows: 6 cases were under 1 year old, 22 cases from 1 to 4, 48 from 5 and 30, 53 cases were in the 30–44 age group and only 2 were over 45 years old. The incidence in our city is 6 per 100.000 habitants. Vaccination status was known for 83 patients [63% of the cases]. Among them: 62 had never been vaccinated, 14 patients had had 1 dose of MMR and 7 cases had received 2 vaccine doses. Thus, 17% of the cases had been vaccinated with at least one measles vaccine dose

CONCLUSIONS:

Increase in measles incidence affecting some europeans contires reaches Barcelona in December 2010. Measles cases have been mostly associated to non-vaccinated children and adults (all non vaccinated children belong to antivacciantion groups whereas non vaccinated adults are born before MMR vaccination schedules were introduced in1980). This disease is spreading in our city and will continue to do so as long as the non-immunized group continue to increase.

PRESENTED BY: MRS SARAH LAFUENTE VAN DER SLUIS

Keywords: Measles, outbreak, case definition, immunization.

ESCAIDE reference number: 20110120

VACCINE PREVENTABLE DISEASES

Smallpox in the Medici family, Florence, Italy, 1519–1737 – a historical cohort study

Saverio Caini (1–2), John Patrick D’Elios (3), Donatella Lippi (3)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm
2. National Center for Epidemiology (NCE), Budapest, Hungary
3. Department of Anatomy, Histology and Legal Medicine, Faculty of Medicine and Surgery, University of Florence, Italy

BACKGROUND:

Smallpox was declared eradicated in 1979 after nearly two centuries of vaccination campaigns worldwide. Despite it was one of the most devastating diseases known to humanity, little is known about its natural history and epidemiology in the pre-vaccination era. Medical history of the members of the Medici family, reigning in Tuscany in 1434–1737, had been recorded by their doctors for over two centuries. We aimed at describing the epidemiology of smallpox in this fully susceptible population.

METHODS:

All the Grand Dukes of Medici and their first- and second-degree relatives with well documented medical history were included in the cohort. We calculated incidence rate of smallpox (IR), median age at infection and case fatality (CF), overall and stratified by gender.

RESULTS:

Overall, 47 members (22 women) of the Medici family with eligible documentation in 1519–1737 were identified. Twenty-four smallpox cases (10 female) were documented, with an IR of 26.1/100,000 person-years (20.4/100,000 in women, 32.4/100,000 in men; $p=0.10$). Four women and no men died of smallpox (CF 17%). Median age at infection was 15 years for males; in females, median age at infection among those who died was higher than among those who survived (41 vs 26 years). Five smallpox cases were clustered during autumn 1626.

CONCLUSIONS:

High attack rate, older age at infection with smallpox, low case fatality overall but increased risk of death for older female cases were the main epidemiological features observed in this fully susceptible, close-knit population. Reduced contacts with general population and a better socioeconomic and health status could partially explain these findings, that are also suggestive of intrafamilial transmission.

PRESENTED BY: MR SAVERIO CAINI

Keywords: Smallpox, History of Medicine

ESCAIDE reference number: 20110199

POSTER SESSION ABSTRACTS

VACCINE PREVENTABLE DISEASES

Estimation of burden of rotavirus infections in children <5 years old in Poland

Justyna Rogalska (1), Pawel Stefanoff (1), Pawel Gorynski (2), Bogdan Wojtyniak (2), Arie Havelaar (3, 4)

AFFILIATIONS:

1. Department of Epidemiology, National Institute of Public Health-National Institute of Hygiene, Warsaw, Poland
2. Department-Centre of Monitoring and Analyses of Population Health, National Institute of Public Health-National Institute of Hygiene, Warsaw, Poland
3. Laboratory for Zoonoses and Environmental Microbiology, National Institute for Public Health and the Environment, Bilthoven, the Netherlands
4. Institute for Risk Assessment Sciences, Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands

BACKGROUND:

The aim of the study was to estimate the annual incidence of rotavirus-caused diarrheal episodes in the population of children aged 0–4 years in Poland, in order to prepare evidence-based recommendations for future prophylactic interventions.

METHODS:

In order to estimate the annual incidence of rotavirus-caused acute gastroenteritis (AGE) episodes in the general population, cases consulting a general practitioners (GPs), and hospitalized cases, we have reviewed the available publications and datasets. The number of symptomatic AGE cases visiting GPs was obtained from 2009 population-representative retrospective survey. The probability of stool sample collection from AGE cases was obtained from prospective health utilization survey carried out in 19 health units in 2008–2009. The probability of reporting RV-positive laboratory results was estimated by comparing data from hospital discharge records and surveillance notifications. Uncertainty in all variables was quantified using probability distributions. Monte Carlo simulations were used to estimate the number of RV episodes in the community, visiting GPs, and hospitalized, separately for each birth cohort 0–4 years.

RESULTS:

The mean number of rotavirus infections reported to the surveillance system in Poland in 2005–2009 was 336 cases consulting a GP and 14,415 hospitalized cases. We estimated the number of rotavirus infections in children under 5 years at 246,743 (12.78 episodes per 100 person-years), of which 173,437 (8.99) consulted a GP, and 23,953 (1.24) were hospitalized. The obtained surveillance multipliers ranged from 8.3 cases in community for each reported case in children <1 years of age, to 33.9 among children aged 4 years.

CONCLUSIONS:

The present study confirmed the high frequency of RV episodes in the youngest age groups in Poland, and important differences in age-specific RV surveillance sensitivity.

PRESENTED BY: MISS JUSTYNA ROGALSKA

Keywords: Rotavirus, burden of disease, surveillance, Poland

ESCAIDE reference number: 20110277

VACCINE PREVENTABLE DISEASES

Epidemiology and surveillance of invasive meningococcal disease (IMD) in Ireland, 2010

S. Cotter (1), P. O'Lorcain (1), M. Fitzgerald (1), D. O'Flanagan (1), M. Cafferkey (2), K. Murphy (2) & N. O'Sullivan (2)

AFFILIATIONS:

1. Health Protection Surveillance Centre, Dublin (HPSC) and
2. Irish Meningococcal and Meningitis Reference Laboratory (IMMRL)

BACKGROUND:

Historically, meningococcal incidence rates in Ireland have exceeded those reported in the majority of EU countries. Since 1981 bacterial meningitis (including meningococcal septicaemia) has been notifiable in Ireland. In 2004, meningococcal disease (invasive) became notifiable as a separate and specific disease.

METHODS:

All bacterial meningitis and meningococcal disease notifications between 1999–2010 on the national Computerised Infectious Disease Reporting (CIDR) system were analysed to describe the change in epidemiology of the disease over time. Data analysis included determining demographic characteristics of cases, serogroup distribution, outcome and laboratory confirmation methods.

RESULTS:

The incidence rate of IMD notifications has declined from a peak in 1999 (14.8/100,000) to 114 cases (2.7/100,000) in 2010. The incidence of serogroup C disease declined from 3.7/100,000 (1999) to 0.09/100,000 (2010) (98% reduction); meningococcal B disease declined from 8.1/100,000 to 2.2/100,000 (2010) (73% reduction). In 2010, 82% of cases were due to serogroup B (n=93), 67% (n=62) cases were less than 5 years of age. Of all cases 3.5% (n=4) were caused by serogroup C; cases were aged 5–19 years (n=3) and 65–69 years (n=1); 86% of notifications were laboratory confirmed: PCR exclusively (50%); PCR and culture (25%); culture alone (7%); serology (4%); microscopy (3%). Of the five IMD related deaths in 2010, (case fatality ratio of 4%), four were due to serogroup B and for one death no organism was detected. The last reported serogroup C death in Ireland occurred in 2008.

CONCLUSIONS:

Overall IMD incidence has decreased markedly since 1999; a rapid decline MenC incidence followed the introduction of the MenC vaccine in 2000. Meningococcal B disease is now the main cause of bacterial meningitis in Ireland.

PRESENTED BY: DR SUZANNE COTTER

Keywords: Meningococcal disease, MenC vaccine

ESCAIDE reference number: 20110294

VACCINE PREVENTABLE DISEASES

The Epidemiology of Invasive Meningococcal Disease in Europe, 2008–2009

Ida Czumbel, Phillip Zucs

AFFILIATIONS:

European Centre for Disease Prevention and Control, Stockholm, Sweden

BACKGROUND:

The objective of this analysis was to describe the surveillance and epidemiology of invasive meningococcal disease (IMD) in Europe in 2008 and 2009.

METHODS:

Designated national experts from Member States (MS) reported data into the European Surveillance System (TESSy). Out of 30 EU/EEA countries with a comprehensive and passive reporting system, 28 submitted case-based data. Case definitions varied between countries, with the majority applying the 2008 EU case definition.

RESULTS:

In 2008 and 2009, 9 615 cases of IMD were reported with an overall notification rate of 0.99/100,000 in 2008 and 0.92/100,000 in 2009. The highest incidences were reported by Ireland (3.68/100,000 in 2008 and 3.37/100 000 in 2009) and the United Kingdom (2.29/100 000 in 2008 and 2.02/100 000 in 2009). The highest age-specific rates were notified in infants <1 year (18.3/100 000 in 2008 and 15.9/100 000 in 2009). Serogroup B accounted for the largest proportion of cases (71%), followed by serogroup C (13%). In countries with MenC vaccination (MCC), the serogroup C incidences in 2009 were lower in age groups targeted by vaccination (<1 year: 0.54/100 000; 1–4 year: 0.22/100 000), compared with countries without MCC vaccination (<1 year: 1.01/100 000; 1–4 year: 0.45/100 000). The overall case fatality was 8.5% (422 deaths) in 2008 and 7.4% in 2009 (340 deaths). Multilocus sequence typing (11% data completeness) showed that the bacterial population was highly diverse with 26.1% of isolates (n=256) belonging to CC ST-41 complex.

CONCLUSIONS:

Meningococcal disease remains rare across Europe. Infants and children had the highest notification rates. Currently, serogroup B causes the majority of infections. Notification rates due to serogroup C are lower in countries with MCC compared to countries without MCC vaccination.

PRESENTED BY: DR IDA CZUMBEL

Keywords: Invasive meningococcal disease, serogroup B, serogroup C, Men C vaccination

ESCAIDE reference number: 20110339

VACCINE PREVENTABLE DISEASES

Emergence of invasive meningococcal disease in Europe, 2007–2009

Ida Czumbel, Phillip Zucs

AFFILIATIONS:

European Centre for Disease Prevention and Control, Stockholm, Sweden

BACKGROUND:

The objective of this analysis was to describe the recent emergence of invasive meningococcal disease (IMD) due to serogroup Y in Europe.

METHODS:

Designated national experts from 29 EU/EEA Member States with comprehensive passive IMD surveillance systems reported case-based data for 2007 and 2009 to the European Surveillance System (TESSy) database. Case definitions varied between countries, with the majority applying the 2008 EU case definition.

RESULTS:

From 2007 to 2009, 15 198 cases of IMD were reported with an overall notification rate of 1.1/100 000 in 2007, 0.9 in 2008 and 0.9 in 2009. Serogroup B accounted for the largest proportion of cases with known serogroup (70% in 2007 and 71% in 2008 and 2009), followed by serogroup C (14% in 2007 and 13% in 2008 and 2009) and serogroup Y (3% in 2007–2008 and 4% in 2009). The number of reported Y cases (118 in 2007; 142 in 2008 and 191 in 2009), has increased, mainly in the Nordic countries, which resulted in overall increasing ($p<0.05$) trend in EU (0.24/1 000 000 in 2007, 0.28 in 2008 and 0.38). The most affected age groups by Y disease were persons 65 years of age and older (34% in 2007; 33% in 2008 and 35% in 2009) and 15–19 year olds (14% in 2007; 13% in 2008 and 21% in 2009).

CONCLUSIONS:

While the incidence of IMD remains low across Europe, an overall significant increase in serogroup Y disease occurred in the past three years, affecting mainly the Nordic countries and adolescents.

PRESENTED BY: DR IDA CZUMBEL

Keywords: Invasive meningococcal disease, serogroup Y

ESCAIDE reference number: 20110341

POSTER SESSION ABSTRACTS

VECTOR BORNE DISEASES

Chikungunya virus as a causative agent of fever of unknown origin in Finnish travellers to tropics

Satu Kurkela (1, 2), J. Sane (1), E. Deren (1), E. Huhtamo (1), I. Suomalainen (1), O. Vapalahti (1, 2, 3)

AFFILIATIONS:

1. Haartman Institute, University of Helsinki, Helsinki, Finland;
2. Helsinki University Central Hospital Laboratory HUSLAB, Helsinki, Finland;
3. Faculty of Veterinary Medicine, University of Helsinki, Helsinki, Finland

BACKGROUND:

Many travellers presenting with fever after a trip to tropics are left without a microbiological diagnosis. Establishing the causative agent informs prognosis and choice of treatment, and it serves the purpose of surveillance and disease control. Of the tropical illnesses, Chikungunya virus (CHIKV) infection has become increasingly common among travellers. In Finland, only few imported laboratory-confirmed CHIKV cases have been identified. We aimed to identify CHIKV infections in Finnish travellers presenting with fever after returning from tropics in order to estimate the extent of missed CHIKV infections in this population.

METHODS:

The study population (N=288) consisted of Finnish travellers returning from tropics during 2004–2009 who were originally suspected of but negative for Dengue virus infection, and of whom both acute and convalescent sera were available. The convalescent sera were screened for CHIKV antibodies with IgG immunofluorescence assay (IFA). IgG-positive patients were tested for the presence of IgM and virus isolation was attempted.

RESULTS:

CHIKV antibodies were present in 4/288 (1.4%) of the patients; 3 were acute infections (IgM and IgG positive) and 1 previous immunity (IgG alone). Virus isolation was successful from one of the patients (9-year-old child) with acute infection. The sequence analysis of this new CHIKV strain, which is the first isolate from Finnish patients, showed high similarity with strains isolated from Singapore in 2008.

CONCLUSIONS:

CHIKV infection and Dengue fever are differential diagnostic alternatives due to their clinical resemblance and similar geographical distribution. It appears that CHIKV infections are being underdiagnosed among Finnish travellers to tropics. This may be due to mix up with Dengue fever, as well as low clinical alert. Possibility of CHIKV infection should be considered in travellers presenting with Dengue-like symptoms.

PRESENTED BY: DR SATU KURKELA

Keywords: Arboviruses, Chikungunya

ESCAIDE reference number: 20110077

VECTOR BORNE DISEASES

From elimination of malaria to certification of Armenia as a malaria free territory – 2011

L. Avetisyan, T Rush, E. Maes

AFFILIATIONS:

1. South Caucasus Field Epidemiology and Laboratory Training Program (SC/FELTP), Georgia
2. State Hygienic and Antiepidemic Inspectorate, MOH, Armenia, mobile phone: +37493536746, e-mail: avetisyan_lil@yahoo.com

BACKGROUND:

Malaria has been endemic in Armenia and absent only from 1963–1994 (World Malaria Report, 2010). In 1994 malaria re-emerged and in 1998 1,156 cases were reported. No cases have been reported since 2006 due to systemic measures. Armenia has applied for WHO malaria free territory certification. We evaluated the malaria surveillance system.

METHODS:

We used the WHO Malaria elimination manual (2007) and the US CDC guidelines for evaluating surveillance systems (2001). We reviewed epidemiological and entomological data from 2001–2010 and assessed the system attributes, studied information and sample flow, sample quality control, and surveyed 112 healthcare workers in Ararat and Armavir endemic regions.

RESULTS:

Malaria surveillance was effective at community, marz (regional) and national levels. The system is passive (case and symptoms based) and active (only in Ararat and Armavir marzes). It is simple and representative. Case definition and information flow are simple and acceptable. Standard reporting (2 forms) is used and 92% (103) of the interviewed health workers found it user friendly. System stability is limited – 12 regions have no epidemiologists. Positive specimens and 10% of negatives were rechecked at the marz laboratories, and at the national reference laboratory in Yerevan. In 2010, 28,965 specimens were tested, all were negative; 1,874 of these were rechecked internally, and 30 sent for External Quality Assessment (EQA) at the WHO Collaborating Center – National Reference Laboratory of Parasitic Diseases Diagnosis, National Centre of Infectious and Parasitic Diseases, Bulgaria. A 100% agreement was found.

CONCLUSIONS:

The Armenia surveillance system is useful, simple, acceptable, flexible, representative and ready for WHO certification process. Lessons learned from malaria elimination program will be useful in controlling other infectious diseases in Armenia.

PRESENTED BY: DR LILIT AVETISYAN

Keywords: Malaria, surveillance system, attributes, EQA, certification, malaria free territory

ESCAIDE reference number: 20110127

VECTOR BORNE DISEASES

What do we know about the epidemiology of Lyme Borreliosis in Europe?

Christiane Klier(1), V. Fingerle (1), B. Liebl (2), S. O'Connell (3), A. Sing (1), R. Smith (4), M. Wildner (2)

AFFILIATIONS:

1. National Reference Centre for Borreliae, Section Infectiology, Bavarian Health and Food Safety Authority, Oberschleißheim, Germany
2. Bavarian Health and Food Safety Authority, Oberschleißheim, Germany
3. Health Protection Agency Laboratory, Southampton, UK
4. Public Health Wales, Cardiff, UK

BACKGROUND:

Lyme borreliosis (LB), a multisystemic disease affecting the skin, nervous system joints and heart, is the most common European tick-borne infectious disease. It is caused by spirochaetes of the *Borrelia burgdorferi* (Bb) sensu lato complex which are transmitted by *Ixodes ricinus* and *I. persulcatus*. Although LB is widespread throughout Europe its incidence varies both between and within European countries. There is currently no standardised method for epidemiological data collection across Europe, but data for some countries and regions are available from a variety of published and unpublished sources.

METHODS:

Data on the incidence of LB in Europe were collected by searching medical databases, accessing national health registries and national health services sources, and by personal contacts.

RESULTS:

LB incidence data retrieved from 30 countries demonstrated marked heterogeneity, reflecting varying environmental factors and variations in data sources and collection methods, including clinical manifestations selected for epidemiological purposes, clinical referral patterns and laboratory diagnosis methods. Reported incidence increases from south-western Europe (Portugal <0.4 /105) and the Mediterranean region to the North (Sweden 69/105) and from western Europe (England and Wales, 1.52/105) to central (Switzerland 115/105) and eastern Europe (Slovenia 236/105). Erythema migrans comprises up to 99.2% (range 69% to 99.2%) of reported European LB cases. Disseminated manifestations such as neuroborreliosis (NB) range from 0.9% up to 19.6 %.

CONCLUSIONS:

LB occurs in most European countries, with distinct regional variations in incidence. Standardisation of case definitions and data acquisition methods and training of primary care physicians in LB diagnosis would help to increase consistency and reliability in inter-country reporting and contribute to development of prevention strategies.

PRESENTED BY: DR CHRISTIANE KLIER

Keywords: Lyme borreliosis, epidemiology, incidence, tick-borne disease, Europe

ESCAIDE reference number: 20110173

VECTOR BORNE DISEASES

Two decades Mediterranean spotted fever (MSF) in Bulgaria – a comparative study

Ivan Baltadzhiev

AFFILIATIONS:

Department of Infectious Diseases, Parasitology and Tropical Medicine – Medical University, Plovdiv, Bulgaria

BACKGROUND:

In 1993 MSF, a tick born rickettsiosis (*R. conorii conorii* strain Malish) reemerged in Bulgaria after 20 years of absence. Since then the disease spreads in the old and biggest endemic region – Plovdiv city and its suburbs, annually/1/. We aimed to compare some clinical and epidemiological features of MSF in two periods – the phase of increasing prevalence (1993–2003) and the phase of lowering spread (2004–2010).

METHODS:

1209 patient were enrolled in the study. MSF was confirmed serologically by Immune-fluorescent assay (IFA) in the Reference Laboratory of Rickettsiae. Clinical and epidemiological methods and statistical ones were used.

RESULTS:

By comparing the two phases we found: In the second phase MSF had decreasing prevalence (435 patients) in comparison with first phase (774 patients). For the burden of disease in the first than the second phase, we found: mild forms 41.16% to 35.66%; moderate 32.79% to 43.79%; severe 16.03% to 10.98%; malignant 6.56% to 8.20%; and lethal forms 3.46% to 1.35%. In the second phase increased the percentage of patients over 60 years of age from 31% to 36.08%. The classical clinical picture of the disease and its seasonal distribution is not changed and we did not found either new foci of MSF in the second phase or enlargement of the previous foci.

CONCLUSIONS:

Despite reduced prevalence and mortality rate MSF retains its serious and dangerous clinical course in about 1/5 of patients. MSF is still relevant and far from eliminating disease in Bulgaria. Reference: 1.N. Popivanova, I. Baltadzhiev, Z. Zaprianov. Mediterranean spotted fever in the Plovdiv region of Bulgaria. In: Contemporary state of the rickettsioses in the world and in Bulgaria. Eds: E. Alexandrov, J. Kazar, K. Hechemy, 2007:116–130.

PRESENTED BY: DR IVAN BALTADZHIEV

Keywords: Mediterranean spotted fever, *Rickettsia conorii*, Bulgaria

ESCAIDE reference number: 20110174

POSTER SESSION ABSTRACTS

VECTOR BORNE DISEASES

The Public-Health Impact of Lyme Borreliosis: Retrospective Approach in the Netherlands

Cees C. van den Wijngaard (1), A. Hofhuis (1), M. Harms (1), J. A. Haagsma (2), G. A. de Wit (3), M. E. E. Kretzschmar (1, 4), W. van Pelt (1)

AFFILIATIONS:

1. National Institute for Public Health and the Environment, Center for Infectious Disease Control, Bilthoven, the Netherlands
2. Erasmus MC, Rotterdam, the Netherlands
3. National Institute for Public Health and the Environment, Centre for Prevention and Health Services Research, Bilthoven, the Netherlands
4. Julius Centre for Health Sciences & Primary Care, University Medical Centre, Utrecht, the Netherlands

BACKGROUND:

Lyme borreliosis (LB) is caused by *Borrelia* spp. transmitted by ticks. Erythema migrans (EM), a typical red rash, is the most prevalent early manifestation of LB, but disseminated LB-manifestations also occur, with acute and/or persisting neurological, arthritic, cardiac or ocular symptoms. In the Netherlands, the number of patients with EM has increased during the past 15 years, up to 22.000 cases in 2009. However, incidences of other LB-manifestations are unknown. Our objective is to estimate the public-health impact of LB, with all its manifestations.

METHODS:

We sent questionnaires and LB-case-definitions to all 9000 general practitioners (GPs) and all 5500 medical specialists – neurologists, dermatologists, cardiologists, pediatricians, rheumatologists, internists and ophthalmologists – to report their number of LB-patients per LB-manifestation in 2010. Also, we asked them to send out questionnaires to their LB-patients which included questions regarding disease history, quality-of-life, work absenteeism and medical consumption.

RESULTS:

Preliminary results will be presented. So far, the response to the GP-questionnaire covers a 4.4 million population (27% of 16.5 million Dutch inhabitants). We estimated 21.000 LB cases in 2010, with 78% EM, 12% acute disseminated LB-manifestations and 10% persisting symptoms. Medical specialists (1000 responders) reported 45% EM, 44% acute disseminated LB-manifestations and 11% persisting symptoms. Excluding EM patients, proportions of manifestations for GPs and specialists were very similar. 4200 patient questionnaires have been sent out. The results will be used to estimate the quality-of-life losses and cost-of-illness per LB-manifestation. Together with the estimated incidences, this yields estimates for the disease burden and cost-of-illness of LB in the Netherlands.

CONCLUSIONS:

A retrospective questionnaire to doctors and their patients is an effective design to estimate the public-health impact of Lyme borreliosis.

PRESENTED BY: MR CEES VAN DEN WIJNGAARD

Keywords: *Borrelia burgdorferi* s.l.; Lyme Disease; Ticks; Cost of Illness; Quality of Life

ESCAIDE reference number: 20110217

VECTOR BORNE DISEASES

Prediction model for estimating Pogosta infections in Finland

Katri Jalava (1), J. Sane (2), J. Ollgren (1), O. Rätti (3), S. Kurkela (2), S. Hartonen (4), P. Pirinen (4), O. Vapalahti (2), R. Ruuhela (4), M. Kuusi (1)

AFFILIATIONS:

1. Department of Infectious Disease Surveillance and Control, National Institute for Health and Welfare, Helsinki, Finland
2. Department of Virology, Haartman Institute, University of Helsinki, Helsinki, Finland
3. University of Lapland, Rovaniemi, Finland
4. Finnish Meteorological Institute, Helsinki, Finland

BACKGROUND:

Arthropod-borne Sindbis virus (SINV) is the causative agent of Pogosta disease in Finland. The disease is characterised by fever, rash and joint symptoms and epidemics occur cyclically. Cases occur between July and October and major outbreaks have occurred in 1981, 1988, 1995 and 2002. Forest grouse (tetraonidae) are suspected as viral reservoirs and the infection is transmitted to humans by mosquito bites.

METHODS:

We used Pogosta surveillance data from 1984 to 2008/2009 to predict cases for 2009 and 2010 by health care district. The data was modelled with two part hurdle model with negative binomial distribution for the count model taking into account the monthly terms and 84-month (7-year) cycle using R. Weather, agricultural, socio-economic and forest grouse data were used as explanatory variables.

RESULTS:

We identified temperature and rainfall in June as important positive explanatory variables both for occurrence and incidence of the disease. Pine tree area, regulated water shore length, temperature and rainfall in May, forest grouse density (negative) and cases from previous year were significant for the occurrence of the disease. Depth of snow cover, unsalted water area, population working in agriculture, income (negative) and forest grouse density (negative) were important for incidence of the disease. Monthly indicators and the 84 month terms were significant. The prediction for 2009 was 100 cases (occurrence 106) and for 2010 83 cases (occurrence 57).

CONCLUSIONS:

The model predicted SINV infections quite accurately. However, the data did not include many 84-month cycles and mosquito surveillance data was not available. The model confirmed weather variables as important predictors, likely to reflect mosquito population magnitude. The role of forest grouse needs further studies. The regulated water shore probably enables mosquito development.

PRESENTED BY: DR KATRI JALAVA

Keywords: Sindbis Virus, Arthropod Vectors, Models, Statistical, forecasting

ESCAIDE reference number: 20110222

VECTOR BORNE DISEASES

Assessing the risk of human granulocytic anaplasmosis after tick bite in Bavaria

Beatrix von Wissmann (1, 2, 3), V. Fingerle (1), C. Hizo-Teufel (1), W. Hautmann (1)

AFFILIATIONS:

1. Bavarian Health and Food Safety Authority (LGL), Institute for Health, Oberschleißheim, Germany
2. Postgraduate Training for Applied Epidemiology (PAE, German FETP) Robert Koch Institute, Dept. Infectious Disease Epidemiology, Berlin, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

BACKGROUND:

Only isolated incidences of human granulocytic anaplasmosis (HGA) have been reported in Europe to date. However, entomological studies in Bavaria, Germany show an *Anaplasma phagocytophilum* prevalence varying locally between 2–35% in the tick vector. *Borrelia burgdorferi*, the most common tick-borne human pathogen in Germany, occurred in 15–36% of ticks. Using the risk of *B. burgdorferi* infection for comparison, this study assessed whether there was a risk of pathogenic *A. phagocytophilum* infection after tick bite in Bavaria.

METHODS:

Overall, 100 patients with tick bite in the preceding 4 weeks reporting to one of 27 participating surgeries were recruited. Questionnaires on demographic data, tick exposure and clinical signs were completed by patients and doctors respectively. Two blood samples taken at an interval of two weeks were tested for *A. phagocytophilum* and *B. burgdorferi* using serology.

RESULTS:

Preliminary serological results for 84 patients showed evidence for an acute infection of *A. phagocytophilum* without clinical manifestations in one patient. Two patients with a serologically detected acute *B. burgdorferi* infection presented with an erythema migrans. A seroprevalence of 4.8% (95%CI: 1.9–11.6%) for *A. phagocytophilum* and 10.7% (95%CI: 5.7–19.1%) for *B. burgdorferi* indicating past exposure, was detected. No statistically significant difference in seroprevalence by region of residence was detected.

CONCLUSIONS:

The detected seroprevalence of *B. burgdorferi* fell into the range expected for occupational risk groups, indicating selection of participants with frequent tick exposure. Compared to 2 clinical *B. burgdorferi* infections, the only detected acute infection of *A. phagocytophilum* presented without clinical signs. This evidence supports first entomological indications that the strains of *A. phagocytophilum* present in the Bavarian tick population may infect humans but the infections are transient and of low pathogenicity.

PRESENTED BY: DR BEATRIX VON WISSMANN

Keywords: *Anaplasma phagocytophilum*, *Borrelia burgdorferi*, tick-borne infections, serology

ESCAIDE reference number: 20110224

VECTOR BORNE DISEASES

Epidemiology of leishmaniasis in Barcelona, 1999–2010

Dr. Cecilia Tortajada, Pilar Gorrindo, Dolores Vilarante, Pere Simó

AFFILIATIONS:

Epidemiology Service. Public Health Agency of Barcelona

BACKGROUND:

The Mediterranean region is an endemic area for Leishmania. In Barcelona, since 1997, human leishmaniasis is a communicable disease. In Spain the epidemiology of leishmaniasis has been influenced by the AIDS/HIV epidemic and in recent years by migration from other endemic areas. We performed a descriptive analysis of the epidemiology of leishmaniasis in Barcelona from 1999 to 2010.

METHODS:

Analysis of all cases of leishmaniasis reported to the Epidemiology Service of the Public Health Agency of Barcelona. We evaluated the number of cases by year of symptoms onset and the distribution by sex, age, country of origin, serological status for HIV infection, and clinical presentation (visceral, cutaneous, muco-cutaneous).

RESULTS:

The number of annually reported cases has not significantly changed for the period of study (1999–2000: 17 2001–2002: 33 2003–2004: 14 2005–2006: 22 2007–2008: 16 2009–2010: 17). Age (mean+/-SD) was 32.5+/-19, it remained constant along this period and not differences between men and women were observed. The percentage of women has gradually increased from 23% (1999–2000) to 41% (2009–2010). An increase of foreign born people was observed, from 0% (1999–2000) to 35% (2009–2010). HIV/SIDA cases went down from 47% (1999–2000) to 12% (2009–2010). Visceral presentation had decreased from 87% (1999–2000) to 41% (2009–2010), while the cutaneous and muco-cutaneous raised from 13% to 53%. Eighty-nine per cent of HIV/SIDA cases presented visceral leishmaniasis and 8.5% were muco-cutaneous or cutaneous, while for non HIV/SIDA cases it was 68% and 28% respectively. Foreigners presented more frequently muco-cutaneous or cutaneous forms (47%) than Spaniards (16%).

CONCLUSIONS:

There has been a decreased in cases co-infected by HIV and in visceral presentation. An increase in foreigners and cutaneous and muco-cutaneous forms were observed. The percentage of women also increased.

PRESENTED BY: DR CECILIA TORTAJADA

Keywords: *Leishmania*, surveillance

ESCAIDE reference number: 20110267

POSTER SESSION ABSTRACTS

VECTOR BORNE DISEASES

Risk factors for tick-borne encephalitis differ between endemic and non-endemic regions

Pawel Stefanoff (1) Magdalena Rosinska (1), Steven Samuels (2), Dennis White (2, 3), Aleksandra Turczynska (1), Andrzej Zielinski (1), Dale Morse (4)

AFFILIATIONS:

1. Department of Epidemiology, National Institute of Public Health – National Institute of Hygiene, Warsaw, Poland
2. State University of New York at Albany School of Public Health, Rensselaer, NY
3. New York State Department of Health, Albany, NY
4. National Center for Emerging and Zoonotic Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, GA, USA

BACKGROUND:

Tick-borne encephalitis (TBE) is endemic in Central Europe, however no analytical TBE risk factor studies have been performed to date. The aim of the present study was to ascertain risk factors for TBE symptomatic infection among residents of Poland.

METHODS:

In the population based, prospective case-control study we enrolled each TBE case reported during 2009 to the local health department. Two controls for each case were randomly selected from the national population register, matched by age (+/- 5 years), sex and district of residence. For each subject a 4-page questionnaire was filled. We used conditional logistic regression to assess the independent associations between disease and socio-economic factors, occupational and recreational exposures.

RESULTS:

Of 351 TBE cases reported in Poland in 2009, 185 were included in the analysis. From 2,704 subjects selected from the population register, 331 matched controls were included. Separate models were fitted for residents of known endemic (model_E) and non-endemic areas (model_nonE). In both models TBE risk factors were: recreational exposure >10hrs/week (adjusted OR aOR 3.36 [1.40-8.02] in model_E and 5.45 [1.27-23.46] in model_nonE); and the following protective factors: education (aOR per one education level increase 0.71 [0.53-0.97], 0.65 [0.41-1.06], respectively), and travel to non-endemic areas (aOR 0.44 [0.21-0.95], 0.32 [0.12-0.90], respectively). In model_E, unemployment (3.41), physical work (2.25) and living close to woodland (aOR ≤50m vs >1km =3.02) increased risk, while outdoor work >20hrs/week (0.47) was protective. In model_nonE, living far from woodland (aOR >1km vs. <50m =12.24) and travel to endemic areas (6.00) were risk factors.

CONCLUSIONS:

The results of the study highlight the need to differentiate public health interventions between endemic and non-endemic regions, as socio-economic status may play more important role in endemic regions.

PRESENTED BY: DR PAWEŁ STEFANOFF

Keywords: Tick-borne encephalitis, case-control study, Poland

ESCAIDE reference number: 20110313

VECTOR BORNE DISEASES

A bibliographical atlas on arthropod vectors to support risk-based surveillance activities for vector-borne diseases in Italy

Lapo Mughini Gras (1), D. Boccolini (1), F. Severini (1), G. Bongiorno (1), C. Khoury (1), R. Bianchi (1), R. Romi (1), G. Capelli (2), L. Gradoni (1), G. Rezza (1), L. Busani (1)

AFFILIATIONS:

1. Istituto Superiore di Sanità, Rome, Italy
2. Istituto Zooprofilattico Sperimentale delle Venezie, Legnaro, Italy

BACKGROUND:

Atlas datasets are the basis of many surveillance-oriented initiatives, providing qualitative data for documenting distribution of epidemiologically-relevant species. For major arthropod vectors in Italy, many occurrence data are available, but they are scattered in the literature. Collecting, harmonizing and mapping these data could provide information relevant for vector-borne disease surveillance. Here we outlined the structure behind the first bibliographical atlas on arthropod vectors in Italy that is currently being finalized.

METHODS:

We collected occurrence data of mosquito, sand-fly and tick species reported in Italy at the municipal level by scrutinizing available literature published between 1 January 1985 and 31 December 2009. Occurrence data of each species were georeferenced and symbolically mapped on a quinquennial basis using a ED-1950-UTM physical map of Italy (zone 32). Mapping was performed using ESRI-ArcGIS 9.

RESULTS:

105, 35 and 40 citations were eligible for collecting mosquito, sand-fly and tick species occurrence data, respectively. A total of 1,873 (23.14%) municipalities had at least one mapped species, 1,496 (18.48%) of which for mosquitoes (47 species, 7 genera), 154 (1.90%) for sand-flies (7 species, 1 genus), and 353 (4.36%) for ticks (26, species, 8 genera). The atlas was mainly focused on 19 mosquito, 4 sand-fly and 17 tick species of medical importance in Italy. Each mapped species was accompanied by a brief account in standard layout.

CONCLUSIONS:

This atlas represents a dynamic tool to be updated regularly. It makes the point on the literature so far produced by collecting, harmonizing and mapping available occurrence data of major arthropod vectors in Italy. These data provide the basis for predictive niche-modelling of species distribution based on environmental conditions, as well as for risk assessment and risk-based surveillance of vector-borne diseases.

PRESENTED BY: MR LAPO MUGHINI GRAS

Keywords: Arthropod vector, vector-borne disease, atlas dataset, mapping tool, Italy

ESCAIDE reference number: 20110321

VECTOR BORNE DISEASES

Transmission Potential of Chikungunya Virus in Temperate Climate Countries and Effectiveness of the Control Measures Enacted in Italy

Piero Poletti (1), M. Ajelli (1), S. Merler (1), C. Rizzo (2), G. Messeri (3, 4, 5), R. Vallorani (4, 5)

AFFILIATIONS:

1. Bruno Kessler Foundation, Trento, Italy
2. National Center for Epidemiology Surveillance and Health Promotion, Istituto Superiore di Sanità, Rome, Italy
3. Institute of Biometeorology, National Research Council, Florence, Italy
4. Consorzio LaMMa (Laboratory of Monitoring and Environmental Modelling for the sustainable development), Sesto Fiorentino, Italy
5. National Research Council, Sesto Fiorentino, Italy

BACKGROUND:

During summer 2007 Italy experienced the first large outbreak (161 laboratory confirmed cases – 10.2% cumulative attack rate) caused by Chikungunya virus (CHIKV) documented in a temperate climate country. We investigated the transmission potential of CHIKV in Italy, to provide insight to the possible impact of future outbreaks in temperate climate regions, and to the effectiveness of different intervention strategies.

METHODS:

We developed a model, explicitly depending on climatic factors, describing the temporal dynamics of the competent vector (*A. Albopictus*) coupled to a disease transmission model describing CHIKV spread in both humans and mosquitoes.

RESULTS:

Model simulations well capture both notification and seroprevalence data as reported for the Italian outbreak. We found that the basic reproduction number of that epidemic was in the range 1.8–6 and the probability of observing a major outbreak after the introduction of one single index case was in the range 32%–76%. Moreover, our analysis strongly support the efficacy of the disinfection strategy performed during the outbreak, which drastically contributed to reduce the cumulative attack rate (of about 88%).

CONCLUSIONS:

Even though the outbreak was occurred in a temperate climate country, the estimated CHIKV transmission potential was sensibly high – in the range observed in tropical areas. Nonetheless, it would be possible to control new CHIKV epidemic outbreaks in climate regions by performing (massive) timely interventions. Finally, the performed analysis confirm the high risk to Europe of tropical vector borne diseases mainly as a consequence of climate and human mobility pattern changes.

PRESENTED BY: MR PIERO POLETTI

Keywords: Chikungunya, Italy, Mathematical Model, disease control

ESCAIDE reference number: 20110332

ZOONOSES

Outbreak of Avian Influenza H9 in a poultry farm, East of England, 2010

Williams CJ (1), Swift A (1), Gent N (1), Reacher M (3), Wreghitt T (4), Rolfe K (4), Ellis J (5), Hoschler K (5), Brown I (6), Phin N (7), Nair P (1), Kearney J (3)

AFFILIATIONS:

1. Norfolk, Suffolk and Cambridgeshire Health Protection Unit, Healthy Living Centre, Croxton Road, Thetford IP24 1JD
2. HPA Emergency Response Division
3. Health Protection Services, East of England.
4. East of England Laboratory, Health Protection Agency, Microbiology & Public Health Laboratory, Level 6, Addenbrookes Hospital NHS Trust, Cambridge, CB2 0QW
5. Virus Reference Dept (V.R.D) – Respiratory Virus Unit, Health Protection Agency, Colindale, London
6. Veterinary Laboratories Agency, Weybridge, Surrey
7. Respiratory Diseases Department – Pandemic Influenza Office, Health Protection Services, Colindale.

BACKGROUND:

In December 2010, restrictions were placed on a Norfolk poultry farm reporting possible avian notifiable disease, with mild illness and no bird deaths. Following PCR identification of an avian influenza virus, control measures were introduced using the precautionary approach.

METHODS:

Farm contacts were identified and assessed. Those with close contact were prescribed prophylactic oseltamivir and advised on personal protective equipment (PPE) and reporting any illness. Serum samples and exposure information were also requested, and nasopharyngeal samples taken from those reporting respiratory illness. Cloacal and nasopharyngeal swabs, and serum, were taken from 60 birds in each of two houses, and tested for antibody to H5, H7 and H9, for influenza M gene by PCR.

RESULTS:

There were 14 human contacts of which 10 were close. 9/10 took prophylactic oseltamivir. 3/14 contacts reported mild respiratory illnesses following contact; the two sampled were negative for influenza A. Acute and convalescent serum was collected from 8/10 contacts. The poultry samples were negative by serology and PCR for H5 and H7, but PCR identified influenza A:H9. Virus was only detected in cloacal samples, and isolation was unsuccessful, so N-typing was not possible. There was H9 specific seroconversion in a few birds. Birds were culled after the estimated virus excretion period had passed.

CONCLUSIONS:

This was an outbreak of the rarely reported H9 avian influenza A with limited human exposure. The poultry results suggest H9 infection with low spread and excretion. Human serology should be ready for presentation by ESCAIDE 2011.

PRESENTED BY: MR CHRIS WILLIAMS

Keywords: Avian, Influenza, Zoonosis

ESCAIDE reference number: 20110095

POSTER SESSION ABSTRACTS

ZOONOSES

Rift Valley fever: A need for a One Health One World approach. Case study from Sudan

Osama Ahmed Hassan (1), Clas Ahlm (1), Rosemary Sang (2), Magnus Evander (3)

AFFILIATIONS:

1. Department of Clinical Microbiology, Division of Infectious Diseases, Umeå University, Umeå, Sweden
2. AVID project, Human Health Division, International Centre of Insect Physiology and Ecology, icipe – African Insect Science for Food and Health, Nairobi, Kenya.
3. Department of Clinical Microbiology, Division of Virology, Umeå University, Umeå, Sweden.

BACKGROUND:

Rift Valley fever (RVF) is an emerging zoonotic disease that crosses national borders and leads to considerable public health and economic impact. It is caused by RVF virus affecting humans and animals. The virus is transmitted through bites from mosquitoes and exposure to viremic blood, body fluids or tissues of infected animals and is spread over different climatic zones. There is a concern that RVF could spread further due to global climatic changes.

METHODS:

Report based on personal experiences and various sources from Sudan and Kenya.

RESULTS:

In Sudan, a large RVF outbreak occurred in 2007 in three agricultural states. There was a total of 747 confirmed human cases including 230 deaths (case fatality 30.8%), although it has been estimated 75,000 were infected. The outbreak revealed the interplay between environment, animal and human health. Most of the patients were from rural areas and belonged to the productive age group. Interestingly, there were also signs of an urban RVF outbreak. The RVF outbreak was an example of the severe economic consequences on rural and national economy where the live animals' trade contributes significantly to the gross domestic product. It also showed how the spread of RVF disrupted the regional animals' trade.

CONCLUSIONS:

Notably, the Sudan outbreak 2007 was discovered in humans before animals. This highlights the lack of sustainable surveillance and collaboration between the veterinary and health authorities. This situation enhances the importance of a One Health One World approach where the deployment of multi-disciplinary teams is crucial to control RVF. This case study implies that the passive efforts at country level was not enough, while the collaboration with international agencies helped significantly in confirming and curbing the outbreak.

PRESENTED BY: MR OSAMA AHMED HASSAN

Keywords: Sudan, Rift Valley fever, Zoonotic disease, Public health and economic impact, Global climatic change and One Health One World approach

ESCAIDE reference number: 20110108

ZOONOSES

Q fever vaccination campaign for medical high risk patients in the Netherlands

Leslie Denise Isken (1), A. J. M. M. Oomen (1), R. J. F. Burgmeijer (2), C. Wijkmans (3), T. Herremans (1), A. Timen (1)

AFFILIATIONS:

1. National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands
2. BOA Cosultancies in Vaccinology & Child Public Health, Amsterdam, The Netherlands
3. Municipal Health Service Hart voor Brabant, 's-Hertogenbosch, The Netherlands.

BACKGROUND:

Patients with cardiovascular disease are at risk for developing chronic Q-fever or complications after infection (medical high risk patients). In the Netherlands, after the third year of the Q-fever outbreak (>4.000 cases), vaccination for medical high risk patients was advised by Dutch Health Council. The only available vaccine, Q-vax, is not licensed in the Netherlands and not previously tested in medical high risk patients. Q-fever infection (previously) contraindicates vaccination. Complexity and unfamiliarity, instituted a centrally organized vaccination campaign in 2010.

METHODS:

Medical high risk patients were informed by their general practitioner and via announcements in regional newspapers. Sera of all included patients were tested for Q-fever IgG-antibodies using immunofluorescence testing. Also skin-test with diluted Q-vax was performed. Vaccination followed only if both tests were negative. Follow-up was secured for 90 days.

RESULTS:

2,688 prospective patients were registered (dec2010-april2011). 1,781 patients were tested (serology and skin-test) and 394 (22%) were positive for previous Q-fever (serology or skin-test) and therefore excluded. 1,366 patients were vaccinated and 21 opted out. Preliminary results show that 306 persons reported an adverse event (160 male, 146 female, age range 15–90 years, median 65). Most events were mild or moderately. So far, 99 serious adverse events are reported in 85 vaccinees. Those were mainly hospitalizations because of unrelated or preexistent medical conditions. Only 2 pronounced local reactions were considered causally related to the vaccination.

CONCLUSIONS:

The Q-vax-vaccination campaign is successful in reach and unique because in short time a large number of medical high risk patients were vaccinated with this unregistered vaccine. Tolerability of the vaccine equals that in healthy volunteers. Further research will indicate vaccine efficacy and safety in these groups.

PRESENTED BY: MS LESLIE ISKEN

Keywords: Coxiella burnetii, Q fever, vaccination, zoonoses, immunization programs, safety surveillance

ESCAIDE reference number: 20110144

ZOOZOSES

Just Counting Sheep? Ecological Associations of Q-Fever Incidence and Ruminant Density in Germany*Christina Frank, Michael Höhle***AFFILIATIONS:**

Robert Koch Institute, Department for Infectious Disease Epidemiology, Berlin, Germany

BACKGROUND:

Q-fever is a zoonotic infection affecting 100 to 400 persons annually in Germany. In the Netherlands a large regional outbreak associated with milk goats took place 2007 through 2010, while case numbers in Germany remained stable.

METHODS:

Assessing the role of cattle, sheep and goats in German Q-fever epidemiology, we conducted ordinal regression using a proportional odds model (to deal with many zero cells and disease clusters). Disease incidence data (2005–2009) came from the German national surveillance database, animal prevalence data from the German statistical office (sheep) and the “HI-Tier“ database (cattle and goats).

RESULTS:

While there was no effect of cattle density on Q-fever incidence, odds for a higher disease incidence category in a county rose by factor 5.7 (95% CI 2.6-14.2) per extra sheep/hectare agricultural land. Higher goat densities lead to lower disease risks.

CONCLUSIONS:

Q-fever incidence in Germany is strongly influenced by sheep but not cattle prevalence. In contrast to the Netherlands, goats do not appear to play a role. However, as animal infection prevalence is not stable, future vigilance and surveillance are in order.

PRESENTED BY: DR CHRISTINA FRANK**Keywords: Q-Fever, ruminants, statistical models, Coxiella**

ESCAIDE reference number: 20110148

ZOOZOSES

Avian influenza A(H5N1) in humans: new insights from constructing a line list of WHO confirmed cases*Lena Fiebig/Jana Soyka, Silke Buda, Udo Buchholz, Manuel Dehnert, Walter Haas***AFFILIATIONS:**

Robert Koch-Institute, Berlin, Germany

BACKGROUND:

Facing the threat of avian influenza (AI) virus in Europe in 2005 prompted us to establish a routine monitoring instrument condensing publicly available information on human AI cases worldwide into a line list to assess case fatality and epidemiological features.

METHODS:

Reports from WHO, ECDC, ProMED, and Reuters Alertnet were screened daily to set up the line list. WHO confirmed cases captured from September 2006 to August 2010 were analyzed to assess the case fatality rate (CFR) and to identify associated factors by logistic regression calculating odds ratios (ORs) and 95% confidence intervals (CIs).

RESULTS:

A total of 235 AI cases were identified. Their CFR was 56%, ranging from 28% in Egypt to 87% in Indonesia. Multivariable analysis revealed that odds of dying increased by 33% with each day that passed from symptom onset until hospitalization (OR=1.33; 95%CI 1.11-1.60, $p=0.002$) and were about 6-fold as high in older age groups than in 0–9 years old children. Using Indonesia as a reference, odds of dying were 92% lower in Egypt (OR=0.08; 95%CI 0.03-0.22, $p<0.001$), 81% in China (OR=0.19; 95%CI 0.04-0.90, $p=0.036$), and 79% in Vietnam (OR=0.21; 95%CI 0.06-0.75, $p=0.016$), but not in the grouped remaining countries (OR=0.23; 95%CI 0.04-1.27, $p=0.091$).

CONCLUSIONS:

Our study revealed independent country-specific effects on the CFR; i.e. the low CFR in Egypt was not entirely explained by the cases' young age and short delays from symptom onset to hospitalization as often assumed. Data from the public domain yield important epidemiological information on the global AI situation, once organized in a line list. Thus, such line list, directly placed publicly e.g. by the WHO, might be beneficial to our epidemiological understanding of human AI.

PRESENTED BY: DR LENA FIEBIG**Keywords: Avian influenza, human, case reporting, monitoring, line list, case fatality**

ESCAIDE reference number: 20110154

POSTER SESSION ABSTRACTS

ZOOZOSES

Risk factors for Q fever infection in a large outbreak in a rural setting in Southwest Germany, 2010

Kilic Alper (1, 2), Brockmann SO (2, 3), Butschbacher E (4)
Piechotowski I (2, 5), Zöllner I (2), Wagner-Wiening C (2), Pfaff G (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
2. Baden Württemberg State Health Office, District of Stuttgart Government, Stuttgart, Germany
3. Public Health Office, Reutlingen, Germany
4. Public Health Office Neckar-Odenwald District, Mosbach, Germany
5. Ministry of Social Affairs, Baden-Württemberg, Stuttgart, Germany

BACKGROUND:

In summer 2010, a town in Southwest Germany with 7300 inhabitants experienced a Q fever outbreak with 188 cases. *Coxiella burnetii* was detected in a resident sheep flock grazing near the town centre. We conducted a case-control study to identify risk factors of *Coxiella burnetii* infection in this circumscribed setting.

METHODS:

Cases were residents of town A with onset of symptoms between 27-07-2010 and 16-10-2010 and laboratory confirmed Q fever. Controls were randomly selected from the population register of the municipality, and were offered antibody testing indicative of recent Q fever infection. Questions about outdoor activities, contact with sheep and known risk factors were investigated using a standardized questionnaire. Risk factors for infection were estimated as odds ratios (OR) with 95% confidence intervals (CI) using logistic regression.

RESULTS:

In total, 94 cases (43%) and 143 (48%) controls answered the questionnaire. The median age was 50 years in both groups. Cases were more likely to have an outdoor occupation (OR=10.9, 95% CI 1.3-94.0), have a garden in the same town sector as the sheep stable (OR=3.2, 95% CI 1.2-8.8), be current smokers (OR=2.8, 95% CI 1.1-4.4) and see sheep near home (OR=2.3, 95% CI 1.1-4.7).

CONCLUSIONS:

Our investigation suggests that infections were associated with outdoor activities and proximity to the sheep stable. Furthermore, we were able to independently confirm previous findings that exposed smokers are at higher risk of contracting Q fever than exposed non-smokers. Since Q fever vaccine for ruminants is not licensed in Germany, regulations to periodically test sheep flocks located in the proximity of human settlements for Q fever and keep infected flocks at a minimum distance from human settlements should be considered.

PRESENTED BY: MR ALPER KILIC

Keywords: Q fever, outbreak, case-control study, Germany

ESCAIDE reference number: 20110185

ZOOZOSES

Study of main causes of death following hantavirus infection in Sweden

Anne-Marie Connolly-Andersen (1), K. Ahlm (2), C. Ahlm (1), J. Klingström (3, 4)

AFFILIATIONS:

1. Division of Infectious Diseases, Department of Clinical Microbiology, Umeå University, 901 85 Umeå, Sweden
2. Division of Forensic Medicine, Department of Community Medicine, Umeå University, 901 85 Umeå, Sweden
3. Department of Biopreparedness, Swedish Institute for Communicable Disease Control, 171 82 Solna, Sweden
4. Department of Microbiology, Tumor and Cell Biology, Karolinska Institutet, 171 77 Stockholm, Sweden

BACKGROUND:

Puumala virus (PUUV) is a rodent borne hantavirus endemic in Central and Northern Europe that causes hemorrhagic fever with renal syndrome (HFRS), characterized by blood vessel disturbances, coagulopathy and renal complications. It is also denoted nephropathia epidemica. In Northern Sweden, infections with PUUV are one of the most significant viral infections in adults. Interestingly, in this region the incidence of cardiovascular disease is the highest in Sweden. Seroprevalence studies show that up to 20% of the population above 50 years has been infected with PUUV, which could be a partial contributor to the overall disease and mortality patterns observed in this highly endemic area. We speculated that possible short and long term consequences following PUUV infection might impact the cause of death pattern.

METHODS:

In Sweden PUUV infections is a notifiable disease resulting in a unique register containing 6251 persons from 1997 to 2010. We analyzed the causes of death based on data obtained from the cause of death register for all PUUV-diagnosed individuals that died during this period of time (n = 238). Particular focus was paid to cardiovascular diseases: ICD 100-199. Furthermore, the patients were divided into subgroups based on the following criteria: i) the time lapsed from HFRS diagnosis until death, ii) age and iii) sex.

RESULTS:

When analyzing the causes of death, diseases of the circulatory system was observed in 70% of the patients but decreased over time, suggesting that PUUV can severely affect the circulatory system early after infection. More results will be presented focusing on the impact of age and sex with respect to time post infection until death.

CONCLUSIONS:

It is possible that PUUV infections increase the risk for cardiovascular diseases.

PRESENTED BY: DR ANNE-MARIE CONNOLLY-ANDERSEN

Keywords: Zoonoses, hemorrhagic fever with renal syndrome, emerging diseases, cause of death, cardiovascular diseases

ESCAIDE reference number: 20110216

ZOOZOSES

A cluster of Hepatitis E infections: possible link with raw pork liver sausages and seafood, south of France 2011

Anoek Backx (1, 2), P. Colson (3), R. Gérolami (4), V. Vaillant (5), E. Couturier (5) A. Armengaud (2)

AFFILIATIONS:

1. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control, Stockholm, Sweden
2. South Regional Office of the French Institute for Public Health Surveillance, Marseilles, France
3. Clinical and diagnostics department for infectious and tropical diseases, Academic hospital la Timone, Marseilles, France
4. Department of hepatology and gastro-enterology, Academic Hospital La Conception, Marseilles, France
5. Infectious Diseases Department of the French Institute for Public Health Surveillance, Saint Maurice, France

BACKGROUND:

A cluster of hepatitis E (HEV) cases was detected in Marseilles in March 2011. Previous HEV outbreaks in this region were linked to figatelli: uncured pork-liver sausages. An investigation was launched to identify the vehicle of transmission to prevent further cases.

METHODS:

A case was defined as a person with a laboratory confirmation of HEV by real-time PCR or anti-HEV IgM. Cases were interviewed by telephone using a standardised questionnaire. The outbreak was described and veterinary and alimentary product investigations were undertaken to trace the source.

RESULTS:

Ten males and one female began showing symptoms (8) or were diagnosed but asymptomatic (3) between January-March 2011 (median age 58; range 39–80 years). Eight patients were hospitalised: seven recovered well; one person with underlying illnesses died. Three asymptomatic cases were discovered during post-renal transplantation check-ups. Genotype 3 was identified in eight, and genotype 4 in two persons. Six persons had eaten figatelli: four consumed this raw, two partially raw. Six persons had eaten raw seafood. Five persons were exposed to both. No exposures to other possible risk factors were identified. Veterinary inspection services could trace some figatelli to different retailers and suppliers but failed to trace up to producer levels. No unique common source was identified.

CONCLUSIONS:

Even though many cases consumed raw seafood, the identified genotypes point towards raw consumption of figatelli as the most probable source of infection. Previous HEV outbreaks in this region have led to obligatory labelling since 2009 indicating that figatelli should be thoroughly heated before consumption. The traced figatelli all had these indications, but none of the consumers recalled having seen this. Hence, a clearer message to inform the consumers is suggested.

PRESENTED BY: MS ANOEK BACKX

Keywords: Hepatitis E, raw pork liver consumption, figatelli, raw seafood consumption, HEV, HEV genotype 4

ESCAIDE reference number: 20110269

ZOOZOSES

Seroprevalence of antibodies against Francisella tularensis (Tularaemia) in nine municipalities in South West Germany, 2008

Christiane Wagner-Wiening (1), S. O. Brockmann (1, 2), I. Kompauer (1), W. Splettstösser (3), P. Kimmig (4), G. Pfaff (1), I. Piechotowski (1, 5)

AFFILIATIONS:

1. Baden Wuerttemberg State Health Office, Stuttgart, Germany
2. Public Health Office, Reutlingen, Germany
3. Bundeswehr Institute of Microbiology, Munich, Germany
4. University of Hohenheim, Stuttgart, Germany
5. Ministry of Social Affairs, Baden-Württemberg, Stuttgart, Germany

BACKGROUND:

Tularaemia is a rare, notifiable zoonosis in Germany. Between 2001 and 2010, 30 of 106 nationwide cases (28,3%) originated in the state of Baden-Wuerttemberg (BW), South West Germany. Infection sources include handling infected animals, consuming their meat, and tick or mosquito bites. A 2002 community population survey in Leutkirch, BW yielded a seroprevalence of 2%, as compared to 0,2% in a 2004 nationwide study. We used a population based study on risk factors for Q fever to add ancillary epidemiologic and spatial data on Francisella tularensis infection.

METHODS:

In 2008, cross-sectional community population surveys were conducted in nine rural or suburban municipalities (population range 3 500 – 30 000, median 12 000). In each area, 400 residents aged between 18 and 65 years were randomly selected from the population registry and were offered antibody testing for Francisella tularensis. Sera were analysed by enzyme-linked immunosorbent assay with a confirmatory immunoblot test in positive specimen.

RESULTS:

A total of 1 057/3 600 eligible persons (29,5%) declared informed consent to the seroprevalence study. Response rates varied by municipality between 18,3% and 46% (median 30%). Antibodies against Francisella tularensis were detected in 26/1057 participants (2,5%). Positive seroprevalence varied by municipality between 1,2 and 4,3% (median 2,2%).

CONCLUSIONS:

High population seroprevalence rates render handling of infected animals or foodborne infection unlikely as the main route of exposure. In our setting, the role of vector mediated exposure, i.e. via mosquitoes or ticks, remains unclear. Although limited by response rate, our findings contribute evidence for a regional variance of risk for infection with Francisella tularensis in South West Germany, and possibly for an underdiagnosis of clinical disease.

PRESENTED BY: MRS CHRISTIANE WAGNER-WIENING

Keywords: Tularemia, Francisella tularensis infection, seroepidemiologic study, Community surveys, Germany

ESCAIDE reference number: 20110320

POSTER SESSION ABSTRACTS

ZOOZOSES

Analysis of factors associated with *Salmonella* pen positivity in holdings with breeding pigs, EU-wide baseline survey, 2008

Giusi Amore, F. Boelaert, P. Mäkelä

AFFILIATIONS:

European Food Safety Authority (EFSA), Parma, Italy

BACKGROUND:

Pig meat is one of the main sources of human salmonellosis. It is therefore important to investigate the potential of *Salmonella* contamination throughout the pig production chain. An EU-wide baseline survey was carried in 2008 in holdings with breeding pigs to determine the prevalence of *Salmonella*-positive holdings and to assess the risk factors for *Salmonella* in herds of breeding pigs. Results from risk factor analysis, as well as further results from an additional within-holding prevalence study are presented here.

METHODS:

A total of 5,117 holdings with breeding pigs from 24 EU Member States (MSs), plus Norway and Switzerland, were included in the analyses. In each selected holding, pooled faecal samples were collected from 10 randomly selected pens of breeding pigs and examined for *Salmonella*. Overall, data on 48,951 pens of breeding pigs were analysed.

RESULTS:

Multivariable regression analysis showed that the odds of *Salmonella*-positive pens increased with the number of breeding pigs in the holding and with the following pen-level factors: flooring systems other than slatted floors or solid floors with straw, presence of maiden gilts, number of pigs per pen, feed of commercial compound origin or pelleted feed. *S. Typhimurium* and *S. Derby* were widespread and dominant in the EU, in both breeding and production holdings. However, many other serovars were relatively prevalent in Western EU MSs. A complementary within-holding prevalence study indicated that the pooled faecal sampling method could have underestimated the EU-level true prevalence of *Salmonella*-positive holdings with breeding pigs by 20%.

CONCLUSIONS:

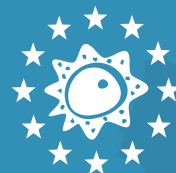
MSs may consider the factors found to be associated with *Salmonella*-positive pens at the EU-level in this survey when they are designing and implementing national *Salmonella* control programmes for breeding pigs.

PRESENTED BY: MR FRANK BOELEART

Keywords: *Salmonella*, breeding pigs, baseline survey, risk factors, EU

ESCAIDE reference number: 20110358

SPECIAL PLENARY SESSION:
EHEC/HUS 2011 **ABSTRACTS**



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SPECIAL PLENARY SESSION: EHEC/HUS 2011 ABSTRACTS

SPECIAL PLENARY SESSION: EHEC/HUS 2011

Challenges in unmasking a stealth vehicle in a large outbreak of haemolytic uraemic syndrome caused by STEC O104, associated with sprouts, Germany, 2011

Mona Askar (1, 2, 3), M. Höhle (1), C. Remschmidt (1), Y. Deleré (1), C. Santos-Hövenner (1), G. Falkenhorst (1), P. Stöcker (1, 2, 3), A. Takla (1, 2, 3), M. Nachtnebel (1, 2, 3), M. Marx (1), M. Richter (4), W. Espelage (4), C. Schoene (4), M. Faber (1), C. F

AFFILIATIONS:

1. Department for Infectious Disease Epidemiology, Robert Koch Institute, Germany
2. Postgraduate Training for Applied Epidemiology (PAE, German FETP), Robert Koch-Institute, Germany
3. European Programme for Intervention Epidemiology Training (EPIET), European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
4. Federal Information Centre for Biological Security (IBBS), Robert Koch Institute, Germany

BACKGROUND:

In May 2011, a large diarrhoea and haemolytic uraemic syndrome (HUS) outbreak caused by Shiga toxin-producing *Escherichia coli* (STEC) O104 occurred in Germany. Initial studies found associations between consumption of raw vegetables (cucumbers, tomato and salad) and disease. An additional study was conducted aiming at reducing the number of suspected food vehicles.

METHODS:

A case-control study was conducted between 29 May and 4 June. Cases were adult HUS patients in three northern German cities; controls were individually matched on age group, gender and neighborhood (case-control ratio 1:3). Food items included those frequently mentioned in previous explorative interviews with other HUS patients and sprouts (reported by only 25% of explored interviewees). Exposure period was defined as the 2 weeks before diarrhoea onset (cases) or interview (controls). Association of food items and HUS were investigated using univariable and multivariable conditional logistic regression. After other investigations suggested sprouts as the vehicle (also reported in the media), a subset of participants was re-interviewed regarding sprout consumption; subsequent results were extrapolated.

RESULTS:

Twenty-six cases and 81 controls were included. Univariable, consumption of goat cheese and sprouts were significantly associated with disease. In multivariable analysis, cucumbers (OR=6.0, 95% CI 1.1-31.3) and sprouts (OR=5.8, 95% CI 1.2-29) remained significant; 88% of cases reported cucumber consumption, but only 25% reported sprout consumption. Re-interviewed, additional 3/8 cases but 0/37 controls recalled eating sprouts, raising the number of sprout-eaters among cases to an estimated 52%.

CONCLUSIONS:

We found an association between sprout consumption and HUS. Sprouts are corroborated by other evidence as the vehicle of this outbreak. Sprout consumption appears particularly hard to recall. Therefore, the threshold for including such "stealth vehicles" into hypothesis-testing studies should be low.

PRESENTED BY: DR MONA ASKAR

Keywords: Shiga-toxigenic *Escherichia coli*, Disease outbreaks, Foodborne diseases, Epidemiologic Study Characteristics as Topic, Case-Control Study

ESCAIDE reference number: 20110170

SPECIAL PLENARY SESSION: EHEC/HUS 2011

The key role of microbiological characterisation during the EHEC O104:H4 outbreak in Germany

Camille Escadafal (1, 2), A. Fruth (3), R. Prager (3), E. Tietze (3)

AFFILIATIONS:

1. Robert Koch Institute, Nordufer 20, 13353 Berlin, Germany
2. European Public Health Microbiology Training Programme (EUPHEM), European Centre for Disease Prevention and Control (ECDC) Stockholm, Sweden
3. Robert Koch Institute, Wernigerode Branch, Burgstrasse 37, 38855 Wernigerode, Germany

BACKGROUND:

In spring 2011, Germany has faced the largest outbreak of haemolytic uraemic syndrome (HUS) ever. By May 23rd, the National Reference Centre for Salmonella and Other Enteric Pathogens (NRC SOEP) in Wernigerode has been the first laboratory to identify the serotype of the outbreak strain (OS), an enterohemorrhagic *Escherichia coli* (EHEC) O104:H4. Throughout the outbreak, the laboratory aimed to characterise the OS and design new diagnostic tools to confirm diagnosis and provide technical support to health professionals.

METHODS:

Nationwide, clinicians diagnosing or suspecting EHEC and HUS cases were asked to send stool samples or isolates to the NRC SOEP. After enrichment of coliforms in each sample, further characterisation was performed sequentially by multiplex PCR, serotyping, antimicrobial susceptibility testing, pulsed field gel electrophoresis (PFGE) and plasmid profiling. Once established that the OS was resistant to 3rd generation cephalosporins, cultures on selective media were performed as an alternative to shorten diagnostic.

RESULTS:

From May 19th to August 5th, 3244 samples were received, 2822 were tested by culture, 1023 by PCR, 306 for antimicrobial susceptibility, 239 by serotyping and 93 by PFGE. The OS was detected in 36% of patients. By adapting diagnostic procedures, the confirmed OS diagnostic could be reduced from 5 to 2 days. Results were immediately shared through national and international public health and food safety laboratory networks.

CONCLUSIONS:

Unusual pathogens such as the 2011 German OS are challenging and there is a need to learn how to deepen microbiological and molecular characterisation, exchange rapidly sufficient information and develop new diagnostic rationales as timely and reliable as possible. The expertise gained by the NRC SOEP during the outbreak is now valuable for further studies such as molecular epidemiology and carrier studies.

PRESENTED BY: MRS CAMILLE ESCADAFAL

Keywords: EHEC outbreak, Germany, O104:H4

ESCAIDE reference number: 20110260

SPECIAL PLENARY SESSION: EHEC/HUS 2011**Danish Outbreak Investigation Related to a Large Outbreak of Shiga Toxin-producing *E. coli* O104 in Germany, May-June 2011 – The Important Role of Outlier Investigation**

Luise Müller (1), C. Kjelsø (1), EM. Nielsen (2), F. Scheutz (2, 3), K. Mølbak (1) S. Ethelberg (1, 2).

AFFILIATIONS:

1. Department of Epidemiology, Statens Serum Institut, Copenhagen, Denmark
2. Department of Microbiological Surveillance and Research, Statens Serum Institut, Copenhagen, Denmark
3. WHO Collaborating Centre for Reference and Research on Escherichia and Klebsiella, Statens Serum Institut, Copenhagen, Denmark

BACKGROUND:

In May and June 2011, Germany experienced an unusual and large outbreak of haemolytic uremic syndrome (HUS) and diarrhoea caused by Shiga toxin-producing *E. coli* (STEC) O104:H4. An investigation was conducted in Denmark to identify STEC O104 cases and to investigate source and place of exposure in order to assist the German investigation.

METHODS:

Hospitals and clinical microbiological laboratories were informed to report suspected STEC or HUS cases via telephone to Statens Serum Institut. All cases were interviewed regarding disease onset, travelling and food intake prior to disease onset. A cohort study was conducted among two groups of Danes who had visited the same restaurant in Northern Germany. A case was defined as laboratory confirmed STEC O104:H4 or a patient with HUS and travel history to Germany. German authorities were continually updated on the findings.

RESULTS:

As of 7 July, 25 Danish STEC cases were identified, 13 women and 12 men aged 6–81 years. Two were considered secondary cases. The incubation period ranged from 3–18 days (median 8 days). Nine cases developed HUS. Twenty-two cases had been travelling to Germany before disease onset and they could all be linked to four specific places to eat. Results of a cohort study in one restaurant did not point out any specific food item or meal. The identification of specific places of exposures for the Danish cases was used by the German authorities in the trace-back of food items.

CONCLUSIONS:

The Danish STEC cases were important as outliers to the German outbreak and helped clarify incubation period and specific places of exposure. This underlines the importance of a good and timely international cooperation in complex outbreak situations.

PRESENTED BY: MRS LUISE MÜLLER

Keywords: STEC O104, outbreak, Denmark, outliers

ESCAIDE reference number: 20110237

SPECIAL PLENARY SESSION: EHEC/HUS 2011**International, large sprout associated outbreak of O104:H4 Shigatoxin; Germany – 2011**

Udo Buchholz U (1), on behalf of the RKI HUS Investigation Team), H Bernard (1), D Werber (1), M Böhmer (1), C Remschmidt (1), H Wilkiing (1), Y Deleré (1), M an der Heiden (1), C Adlhoch (1), J Dreesman (2), on behalf of the NLGA HUS investigation team

AFFILIATIONS:

1. Robert Koch-Institut, Berlin, Germany
2. Governmental Institute of Public Health of Lower Saxony (NLGA)
3. Lower Saxony State Office for Consumer Protection and Food Safety (LAVES), Oldenburg, Germany
4. Department of Epidemiology, Statens Serum Institut, Copenhagen, Denmark
5. Federal Office of Consumer Protection and Food Safety (BVL), Berlin, Germany
6. BfR Investigation Team at the Federal Institute for Risk Assessment (BfR), Berlin, Germany
7. Veterinary University Hannover, Germany
8. Swedish Institute for Communicable Disease Control, Solna, Sweden

BACKGROUND:

We investigated causes and circumstances of a large outbreak of Shiga-toxin-producing *Escherichia coli* (STEC) O104:H4 and hemolytic uraemic syndrome (HUS) that occurred in Germany in 2011.

METHODS:

We conducted a matched case-control study, a recipe-based restaurant cohort study, as well as environmental, traceback and trace forward investigations.

RESULTS:

The case-control study included 26 HUS cases and 81 controls. In univariable analysis illness was associated with sprout consumption (matched odds ratio, 5.8; 95% confidence interval (CI), 1.2 to 29), and in multivariable analysis with sprout and cucumber consumption. Twenty-five and 88% of cases reported having eaten sprouts or cucumbers, respectively. The recipe-based study among cohorts visiting restaurant K included 10 groups (N=168). Thirty-one (18%) developed bloody diarrhoea or STEC-confirmed diarrhoea. Customers who were served sprouts were significantly more likely to become ill (relative risk, 14.2; 95% CI, 2.6-infinite). P-values of relative risks of all other raw food items were greater than 0.15. Sprout consumption explained 100% of cases. Traceback of sprouts from the distributor which supplied restaurant K led to producer A. All 41 case clusters with known trading connections could be explained by producer A. Microbiological tests on-site of producer A as well as seed and sprout samples were negative. Producer A was licensed as a horticulture company. On EU level no regulations exist for primary producers of sprouts regarding STEC. Later investigations of the European Food Safety Authority identified imported fenugreek seeds as the outbreak's source.

CONCLUSIONS:

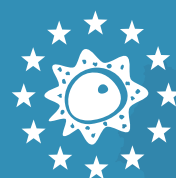
Our investigations identified sprouts as the outbreak vehicle. Licensing of sprout growing farms as food producers, hygienic measures during processing of sprout production and clear microbiological criteria regarding STEC need to be regulated on the European level.

PRESENTED BY: DR UDO BUCHHOLZ

Keywords:

ESCAIDE reference number: 20110367

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ESCAIDE EXTERNAL EVALUATION-MILIEU

ESCAIDE began in 2007, and hence 2011 is the 5th anniversary of the conference. As primary sponsors and organisers of the event, ECDC felt it timely to carry out an independent external assessment of the conference to assess if ESCAIDE meets the needs and expectations of the participations, and fulfils its stated aims.

The external evaluation is being carried out by Milieu Law and Policy Consulting, a consultancy company based in Brussels, Belgium (www.milieu.be), who have some specialisation in evaluation work. Iva Misigova will be representing Milieu at the ESCAIDE conference of 2011. Milieu will collect general impressions of the conference, but primarily they aim to carry out interviews and questionnaires with a number of ESCAIDE delegates both during and after the conference to support their evaluation.

ECDC and the other organising partners would be grateful if you could find the time to support Milieu in their evaluation work, and give feedback on the various aspects of the conference both in 2011 and during the lifetime of the conference since it was launched in 2007. The feedback you provide will be valuable in assessing if the conference is valuable and useful to participants, and identifying areas for further improvement so that the future editions can provide more of the information and content that you wish to see.



