

5 Nations Health Protection Conference



Royal York Hotel, York, North Yorkshire, England
19th – 21st May 2014

Final Programme & Abstracts

#5nations

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Conference Organising Committee

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Dr Chris Whiteside

Consultant in Communicable Disease Control
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Aims and Objectives

The aim of the conference is to provide a focus for continuing professional development for Consultants in Communicable Disease Control, Consultants, Specialists and trainees in Public Health / Health Protection, Health Protection nurses and their colleagues in the epidemiology, and control of infectious, non-infectious diseases and environmental hazards.

The objectives are:

1. To refresh participants' knowledge of the recognition, investigation and control of important infections and other environmental hazards.
2. To inform participants about significant new and emerging problems in health protection and advances in methods of their investigation and control.
3. To stimulate discussion of the practical problems that may confront those responsible for carrying out investigations and implementing control procedures.
4. To foster the maintenance and development of professional networks among those working in control of infection and environmental hazards.
5. To contribute to the development of policies and standards.
6. To provide a focus for health protection issues across the Five Nations.



Monday 19th May 2014	
0930 - 1100	Registration, tea/coffee
1100 - 1115	Welcome and Introduction The Lord Mayor – The Right Honourable Julie Gunnell
1115 - 1145	Keynote Address Aphorisms for Epidemiology and life <u>John Cowden</u> Independent Consultant Epidemiologist, Scotland
Session 1: Labs and leather – investigation of GI outbreaks	
1145 - 1300	<i>Chair: Lorraine Lighton</i> <i>Organiser: Kathie Grant</i>
1145 - 1200	You only find what you're looking for: A mixed pathogen outbreak <u>Jon Lawler</u> , Kirsty Foster Public Health England, North East
1200 - 1215	A tale of two seasons: are we still seeing the effect of the Sydney2012 norovirus strain in England? <u>Natalie Adams</u> , David Allen, Farah Aladin, John Harris, David Brown, Goutam Adak Public Health England, Colindale
1215 - 1230	Don't count your chicken livers: An outbreak of Campylobacter not associated with chicken liver parfait, Surrey, November 2013. <u>S. Trienekens</u> ¹ , C. Anderson ¹ , R. Soyfoo ¹ , J. Duffy ² , R. Gill ² , H. Jones ³ , P. Mook ¹ , C. Ihekweazu ¹ , I. Kar-Purkayastha ² ¹ Field Epidemiology Services Victoria, Public Health England, London, ² Surrey & Sussex Health Protection Team, Public Health England, Horsham, ³ Environmental Health, Runnymede Borough Council, Addlestone
1230 - 1245	International transmission of hepatitis A: epidemiological and virological evidence of shellfish contamination by a single index case in a low incidence area <u>Chris Whiteside</u> ¹ , Laura Dexter ¹ , Chris Williams ¹ , Meirion Evans ¹ , Siew Lin Ngui ² , David Lees ³ ¹ Public Health Wales, Cardiff, ² Public Health England, London, ³ Centre for Environment, Fisheries & Aquaculture Science, Weymouth
1245 - 1300	Use of Multiple Loci VNTR Analysis (MLVA) in identifying cases in an outbreak of Salmonella <u>Christopher Johnson</u> , Judy Hart Public Health Wales, Mold
1300 - 1400	Lunch, Exhibitions & Posters

Monday 19th May 2014**Session 2 Health Protection Practice**

1400 - 1530	<i>Chair: Charles Saunders Organiser: Paul McKeown</i>
1400 - 1415	The positive effects on response rate from offering online self-completion <u>Adrian Wensley</u> , Louise Coole Field Epidemiology Service, Public Health England, Leeds
1415 - 1430	A hepatitis C infected healthcare worker: challenges in conducting a lookback exercise spanning 4 countries and 30 years: The Wales perspective <u>Gill Richardson</u> ¹ , Lika Nehaul ² , Brendan Mason ² , Tracey Deacon ¹ , Daniel Grenyer ¹ , Wendy Warren ¹ , Ceri Harris ² , Marysia Hamilton-Kirkwood ¹ , Jane Layzell ¹ , Debbie Pimbley ¹ , Rachel Jones ² ¹ Aneurin Bevan University Health Board, Gwent, Wales, ² Public Health Wales
1430 - 1445	Achieving standardisation in investigating cross border outbreaks: Developing a toolkit in partnership with Local Authorities <u>Sarah Smith</u> , Leena Inamdar Public Health England, West Yorkshire
1445 - 1500	Health Equity Audit of Section 7A Screening Services in Prisons within Derbyshire and Nottinghamshire Area Team <u>Kelly Mackenzie</u> ^{1,2} , Linda Syson-Nibbs ^{4,5} ¹ University of Sheffield, Sheffield, ² Derbyshire County Council, Matlock, ³ Public Health England South Yorkshire, Sheffield, ⁴ NHS England, Mansfield, ⁵ Public Health England East Midlands, Nottingham
1500 - 1515	How quickly is it possible to conduct a case control study? A review of an investigation into an outbreak of Cryptosporidiosis linked to a paddling pool <u>Simon Padfield</u> Public Health England, Yorkshire and the Humber
1515 - 1530	Novel surveillance and patient management systems to ensure continuity of care within high risk, hard to reach and hard to engage populations <u>Gareth Morgan</u> , Christopher Emmerson, Marion Lyons, Josie Smith Public Health Wales, Cardiff
1530 - 1630	Tea/Coffee, Exhibition & Poster Session



Monday 19th May 2014	
Session 3: Respiratory Infections	
1630 - 1730	<p><i>Chair: Meirion Evans</i> <i>Organiser: Louise Coole</i></p>
1630 - 1645	<p>Investigating an outbreak of Legionnaires' disease: from binoculars to magnifying glasses Gillian Penrice¹, Ann Matheson¹, Diane Lindsay², Robert Marshall³, Alison Potts⁴ ¹Public Health Protection Unit, NHS Greater Glasgow and Clyde, Glasgow, ²Scottish Haemophilus Legionella Meningococcus Pneumococcus Reference Laboratory, Glasgow, ³Renfrewshire Council, Renfrewshire, ⁴Health Protection Scotland, Glasgow</p>
1645 - 1700	<p>Lessons learned: an investigation of a tuberculosis incident in a Roma community John Mair-Jenkins¹, Deborah Harrison², Julie Gratton², Kiran Loi³, Sophia Makki¹ ¹Health Protection Team, Public Health England East Midlands Centre, Nottingham, ²TB Service, Derby Hospitals NHS Foundation Trust, Derby, ³Public Health, Leicester City Council, Leicester</p>
1700 - 1715	<p>Tracking a complex TB outbreak in a boarding school over a five year period: Implications for control Leena Inamdar¹, Adrian Wensley² ¹West Yorkshire Health Protection Team, Public Health England, Leeds, Yorkshire and the Humber, ²Field Epidemiology Services, Yorkshire and the Humber</p>
1715 - 1730	<p>Something lurking in the potting shed - tales of Legionella longbeachae in Scotland Alison Potts, Kevin Pollock, Michelle Marley, Syed Ahmed Health Protection Scotland, Glasgow</p>
1815 - 1930	<p>Drinks and Quiz sponsored by PHMEG The Royal York Hotel <i>Organiser: Lorraine Lighton</i> <i>Quiz Master: Charles Saunders</i></p>

Tuesday 20th May 2014

Session 4: Vaccine-preventable diseases

0815 - 0915	Registration, tea/coffee
0915 - 1015	<i>Chair: Kirsty Foster</i> <i>Organiser: Jackie Hyland</i>
0915 - 0930	Trends in clinical presentation and case fatality of invasive pneumococcal disease cases post-PCV7 and post-PCV13 in the north-east of England <u>Lauren B Wright</u> ¹ , Kaye Chapman ² , Gareth J Hughes ³ , Russell Gorton ¹ , Deb Wilson ² ¹ Field Epidemiology Services North East, Public Health England, Newcastle-upon-Tyne, ² North East Public Health England Centre, Newcastle-upon-Tyne, ³ Academic Unit of Public Health, University of Leeds
0930 - 0945	Neonatal BCG - Implementation of recommendations from an audit of policy and practice across the Yorkshire and Humber Region <u>Louise Coole</u> , Suzanne Coles Field Epidemiology Service, Leeds
0945 - 1015	Rotavirus Vaccination - early impact and herd effects <u>Shamez Ladhani</u> Public Health England Colindale, London

Session 5: Earth Wind and Fire, and wood

1015 - 1115	<i>Chair: Naima Bradley</i> <i>Organiser: Chris Whiteside</i>
1015 - 1030	Exploring the spatial relationship between outdoor air quality, local health outcomes and employment status using a GIS to inform local government health protection policy Giles Ratcliffe ¹ , <u>Subhashis Basu</u> ^{1,2} ¹ University of Sheffield, Sheffield, South Yorkshire, ² Sheffield Teaching Hospitals, Sheffield, South Yorkshire
1030 - 1045	There's no fire without smoke! Reflections on coordinating the multi-agency and public health response to fires. <u>Kirsty Foster</u> ¹ , Paul Davison ¹ , Deborah Wilson ¹ , Karen Lloyd ¹ , Kevin Manley ² ¹ North East Public Health England Centre, PHE, Newcastle upon Tyne, ² Environmental Hazards and Emergencies Department, Centre for Radiation, Chemical and Environmental hazards (CRCE), PHE, Newcastle upon Tyne
1045 - 1100	Calabash Chalk: A source of minerals or self-poisoning? <u>Camilla Ghiassee</u> Centre for Radiation, Chemical and Environmental Hazards, Environmental Hazards and Emergencies Department, Public Health England



Tuesday 20th May 2014	
1100 - 1115	Wood Chipping Processes and Dust: An emerging public health issue? <u>Charlotte Landeg-Cox</u> , Jeff Russell, Adrienne Dunne, Laura Mitchem 1. Centre for Radiation, Chemical and Environmental Hazards, Environmental Hazards and Emergencies Department, Public Health England
1115 - 1145	Tea/Coffee, Exhibition & Poster Viewing
Session 6: Environmental Challenges 2	
1145 - 1300	<i>Chair: Louise Coole</i> <i>Organisers: Naima Bradley & Gavin Dabrera</i>
1145 - 1215	Flooding in England in winter 2013/14: the public health response <u>Angie Bone</u> Public Health England
1215 - 1230	Surma: The look of love or the look of lead? <u>Angeline Walker</u> 1. Centre for Radiation, Chemical and Environmental Hazards, Environmental Hazards and Emergencies Department, Public Health England
1230 - 1245	Mad, bad or sad? Mental health and the environment <u>Alex Stewart</u> , Mike Bradley Cheshire & Merseyside Public Health England Centre, Liverpool
1245 - 1300	UK Recovery guidance and advice for the remediation of the environment following a chemical incident Stacey Wyke, Antonio Peña-Fernández, Raquel Duarte-Davidson, <u>Thomas Pottage</u> Public Health England
1300 - 1400	Lunch, Exhibitions & Posters
1400 - 1515	Poster Session, tea/coffee
Session 7: Vaccine Preventable Diseases – diverse challenges and approaches	
1515 - 1630	<i>Chair: Ebere Okereke</i> <i>Organisers: Jackie Hyland & Kirsty Foster</i>
1515 - 1530	Rabies boosters: serological follow-up of bat workers <u>Bengü Said</u> ¹ , Hilary Kirkbride ¹ , Daniel Horton ² , Anthony Fooks ² , David Brown ¹ , Dilys Morgan ¹ ¹ Public Health England, Colindale, London, ² Animal Health and Veterinary Laboratories Agency, Surrey

Tuesday 20th May 2014	
1530 - 1545	<p>Is meningococcal capsular group W (MenW) an increasing threat in the United Kingdom? Jane Bethea¹, Shamez Ladhani², Steve Grey³, Vanessa MacGregor⁴, Sophia Makki⁴ ¹The University of Leicester, Leicester, ²Public Health England Colindale, London, ³Meningococcal Reference Unit, Public Health England, Manchester, ⁴Public Health England East Midlands, Nottingham</p>
1545 - 1600	<p>Active screening and surveillance for polio among new entrants to Wales from Syria Rhianwen Stiff¹, Nicola Hathway¹, David Florentin², Catherine Moore³, Rebecca Crane⁴, Christopher Williams² ¹Public Health Wales, Health Protection Team, Cardiff, Wales, ²Public Health Wales, Communicable Disease Surveillance Centre, Cardiff, Wales, ³Public Health Wales, Microbiology, Cardiff, Wales, ⁴Cardiff Health Access Practice, Cardiff and Vale University Health Board, Cardiff, Wales</p>
1600 - 1615	<p>Local PCR for measles- Is it used? Does it upset the national system? William Welfare^{1,2}, Kavitha Shankar¹, Rosemary Mc Cann^{1,2} ¹Greater Manchester Public Health England Centre, Manchester, ²University of Manchester, Manchester</p>
1615 - 1630	<p>Invasive Haemophilus influenzae disease in children. Sarah Collins¹, Mary Ramsay¹, Helen Campbell¹, David Litt¹, Mary Slack¹, Shamez Ladhani^{1,2} ¹Public Health England, London, ²St. George's University of London, London</p>
1645 - 1800	PHMEG Annual Meeting
1930 - 0030	Conference Dinner & Entertainment The Royal York Hotel



Wednesday 21st May 2014	
Session 8: Bloodborne virus and Healthcare Associated infections	
0830 - 0930	Registration, tea/coffee
0930 - 1045	<i>Chair: Neil Irvine</i> <i>Organiser: Lelia Thornton</i>
0930 - 0945	Pseudomonas epidemiology in Northern Ireland: outcome from the first year of a unique enhanced surveillance programme in augmented care settings <u>Lynsey Patterson</u> , Lourda Geoghegan, Gillian Smyth, Brian Smyth Public Health Agency, Belfast
0945 - 1000	The prevalence of a Staphylococcus aureus cluster antibiogram in Augmented Care Settings in Northern Ireland <u>Rachel Spiers</u> , Lynsey Patterson, Brian Smyth, Lourda Geoghegan Public Health Agency, Belfast
1000 - 1015	Space-Time Relations of Clostridium difficile cases within a health economy: A Social Network Analysis <u>Iain Roddick</u> ¹ , Wendy Rice ¹ , Judy Ames ³ , Giri Shankar ² , Rowan Slowther ³ , Mark Reacher ¹ ¹ Public Health England Eastern Field Epidemiology Unit, Cambridge, ² Anglia & Essex Public Health England Centre, Thetford, ³ Public Health, Norfolk County Council, Norwich
1015 - 1030	A hepatitis C infected healthcare worker: challenges in undertaking a lookback exercise spanning four countries and 30 years. The England, Scotland and Northern Ireland perspective <u>Renu Bindra</u> ¹ , Louise Coole ⁴ , Stephen Morton ¹ , Charles Saunders ² , Maureen McCartney ³ ¹ Public Health England, Yorkshire and the Humber, ² NHS Fife, Scotland, ³ Public Health Agency, Northern Ireland, ⁴ Public Health England
1030 - 1045	Investigation of newly acquired Hepatitis C in HIV-positive men who have sex with men leads to new information on drug use and higher risk sexual practices <u>Gillian Armstrong</u> ¹ , Say Quah ² , Michael Lavelle ¹ , Maeve Cross ² , Christine Winters ² , Catherine Jackson ² , Sinead Rooney ² , Maureen McCartney ¹ , Yvonne Wilson ² , Lewis Shilliday ¹ ¹ Public Health Agency, Belfast, ² Royal Victoria Hospital Genito-urinary Medicine, Belfast
1045 - 1200	Tea/Coffee, Exhibition & Poster Viewing

Wednesday 21st May 2014**Session 9: Hot Topics**

1200 - 1315	<i>Chair: Dilys Morgan</i> <i>Organiser: Gavin Dabrera</i>
1200 - 1225	Chikungunya in the Caribbean: reason for concern in Europe? <u>Henriette de Valk</u> Institut de Veille Sanitaire, St Maurice, France
1225 - 1250	Assessing the risk of Mycobacterium bovis transmission from cats to human contacts <u>Catherine O'Connor</u> , Amanda Walsh, Dilys Morgan Public Health England, London
1250 - 1315	Meningitis B vaccination and evidence based decision making <u>Mary Ramsay</u> Public Health England
1315 - 1415	Lunch



General Information

Conference Etiquette

Delegates are advised that they are not allowed to take photographs of any posters or presentations without the author's/presenter's consent. Delegates should also obtain consent from an author before citing any of their work that was presented at the conference.

If you would like to tweet about the conference please use #5nations.

Mobile phones should be switched off or placed on 'silent' during sessions. Thank you for your co-operation.

Insurance

The Conference Organisers cannot accept any liability for personal injuries or for loss or damage to property belonging to delegates, either during, or as a result of the conference. Please check the validity of your own personal insurance before travelling.

WiFi Access

The conference is providing Wi-Fi access free to delegates who have their own devices. Please connect to the Principal Hayley network and use one of the following usernames and password:

Username and password 1: 5nationsyork1

Username and password 2: 5nationsyork2

Posters

Posters will be displayed in the Event Centre, the main lecture hall. Posters can be put up from 1000hrs on Monday 19th May and must be removed by 1315hrs on Wednesday 21st May. There will be 3 dedicated poster sessions where poster presenters will be given the opportunity to present their work to delegates. These have been scheduled at the following times:

Monday 19th May: 1530 – 1630

Tuesday 20th May: 1400 – 1515

Wednesday 21st May: 1100 – 1200

Registration/Information Desks

All delegates will receive their name badge, conference documents and all relevant conference information upon arrival at the Royal York Hotel.

The Registration and Information Desks will be open at the following times:

Monday 19th May: 1000 – 1730

Tuesday 20th May: 0900 – 1645

Wednesday 21st May: 0900 – 1315

Tea/Coffee Breaks and Lunch Arrangements

Tea and Coffee points will be located in the Event Centre Foyer and Oak Room. Lunch will be served in the hotel restaurant on Monday & Wednesday and in the Oak Room on Tuesday.

If you have requested a special diet at the time of registering (other than vegetarian), then your name badge will have a sticker on the back which you should show to the catering staff who will bring you your pre-ordered food.

Exhibitor Information

Meningitis Research Foundation

Midland Way, Thornbury, Bristol, BS35 2BS

Tel No

01454 281 811

Website

www.meningitis.org



Millions of people have been affected by meningitis and septicaemia around the world – diseases which can kill and seriously disable in hours.

Meningitis Research Foundation tackles the problem by:

1. Funding research into the prevention, detection and treatment of meningitis and septicaemia;
2. Raising awareness and providing life-saving symptoms and treatment information;
3. Supporting those affected by the diseases.

Oxford Diagnostic Laboratories (ODL®)

94C Innovation Drive,
Milton Park, Abingdon, Oxfordshire, OX14 4RZ

Tel No

01235 433164

Website

www.tbtestingservices.com



Oxford Diagnostic Laboratories is a national reference laboratory located in the U.S. and U.K., offering the T-SPOT®*TB* test for TB screening. Its experienced laboratory professionals are committed to providing the highest quality results and service. Learn how this simple and convenient service can make your TB testing processes more efficient and cost-effective.

Sanofi Pasteur MSD

Mallards Reach, Bridge Avenue,
Maidenhead, Berkshire, SL6 1QP

Tel No

01628 785 291

Website

www.spmsd.com



Sanofi Pasteur MSD is the only European company dedicated exclusively to vaccines, offering a wide range protecting against 20 infectious diseases. Manufacturing efficacious and well tolerated vaccines to help protect health throughout life, Sanofi Pasteur MSD is committed to helping improve individual and public health. The company is a major supplier of vaccines to the NHS for the childhood vaccination programme.

Synlab Clinical Trial

Turmstr. 21, 10559, Berlin, Germany

Tel No

+49 (0) 30 396 085 - 20

Website

www.synlab.com



Synlab is one of Europe's leading laboratory groups; with over 250 laboratories in 24 countries, we offer a portfolio of over 5000 assays and measure 300 million test parameters per year. synlab is the leading provider of analytical healthcare services in the following regions, Austria, Italy, Switzerland and southern Germany.

Keynote Lecture

APHORISMS FOR EPIDEMIOLOGY AND LIFE

John Cowden

Independent Consultant Epidemiologist, Scotland, UK

Of the 100 or so peer-reviewed papers I have had published during 30 years in public health, the one which generated the most correspondence was “Some haphazard aphorisms for epidemiology and life” in *Emerging Infectious Diseases* in 2010. My talk will employ some of my favourite quotes from this paper and elsewhere to illustrate some aspects of the theory and practice of epidemiology.

ORAL ABSTRACTS

01

YOU ONLY FIND WHAT YOU'RE LOOKING FOR: A MIXED PATHOGEN OUTBREAK

*Jon Lawler, Kirsty Foster
Public Health England, North East, UK*

Background: During investigation of a large outbreak (592 cases) at a food festival, 110 faecal specimens were submitted. Incubation period and reported symptoms were consistent with bacterial food poisoning. Salmonella was identified by culture in 26% of specimens. Persistent diarrhoea (median duration 11 days) and abdominal pain were frequently reported. Given the proportion of confirmed cases and unusual symptoms, alternative causes were investigated.

Method:

- 77 faecal samples from cases underwent polymerase chain reaction (PCR) testing for gastrointestinal pathogens (Salmonella, Campylobacter, verocytotoxigenic E.coli, Shigella and enteroaggregative E. coli [EAEC]). Samples selected included both culture negative and culture positive for Salmonella.
- Food samples underwent standard microbiological investigations.
- Further typing of Salmonella isolates from human and food samples was undertaken.

Results:

- **Human:** Salmonella cultured in 29 samples (25/29=Salmonella Agona PT40).

- PCR samples: EAEC was detected in 83% and Shigella in 38%. Two or more organisms were detected in 32%.
- **Food:** Salmonella Agona PT40, E coli and Enterobacteriaceae isolated from fresh curry leaves, used uncooked in food consumed by cases.

Conclusion: We report a large outbreak with microbiological evidence of cause. S Agona PT40 was identified in human and food samples and isolates were indistinguishable. An analytical study corroborated these findings. Microbiological investigation would often stop at this point. PCR testing suggested additional pathogens may have contributed to illness, with some cases being co-infected. Symptoms were consistent with infection with these organisms. Mixed pathogen outbreaks may be more common than currently recognised and outbreak control teams should consider this possibility during investigation.

02

A TALE OF TWO SEASONS: ARE WE STILL SEEING THE EFFECT OF THE SYDNEY2012 NOROVIRUS STRAIN IN ENGLAND?

*Natalie Adams, David Allen, Farah Aladin, John Harris, David Brown, Goutam Adak
Public Health England, Colindale, UK*

Norovirus is the most common cause of gastrointestinal infections in the United Kingdom, with GII-4 strains the most frequently detected. Outbreaks usually peak during winter months however infections occur throughout the

year. In late 2012 a novel GII-4 strain (Sydney2012) emerged, replacing the NewOrleans2009 strain.

This study presents data from laboratory and epidemiology surveillance, extending previously published work, to describe the impact of Sydney2012 across two norovirus seasons and contribute to improving understanding of emerging strains.

In the 2012/2013 season Sydney2012 was the most frequently detected GII-4 strain in circulation, identified in 69% of outbreaks. An early increase in reports to Public Health England's Hospital Norovirus Outbreak Reporting System (HNORS) was observed in October 2012. Between July and December 2012, 480 laboratory-confirmed outbreaks were reported to HNORS, 85% higher than the same period in 2011. However, outbreak reports began to decline earlier than in previous seasons and the season total was 9% lower than the preceding three season average.

This season (July 2013-January 2014), 177 laboratory-confirmed outbreaks were reported to HNORS, 64% lower than the average of seasons 2009/2010-2011/2012. Sydney2012 was associated with 65% of outbreaks, almost completely replacing NewOrleans2009 which accounted for fewer than 2%. The majority of non-Sydney2012 outbreaks were non-GII-4 strains.

The emergence of Sydney2012 appears to have shifted seasonality but not increased the number of outbreaks reported, demonstrating that the relationship between norovirus infections and emerging variants is more complex than often stated. Emergence of a new strain does not necessarily lead to increased norovirus activity.

03

DON'T COUNT YOUR CHICKEN LIVERS: AN OUTBREAK OF CAMPYLOBACTER NOT ASSOCIATED WITH CHICKEN LIVER PARFAIT, SURREY, NOVEMBER 2013

S. Trienekens¹, C. Anderson¹, R. Soyfoo¹, J. Duffy², R. Gill², H. Jones³, P. Mook¹, C. Ihekweazu¹, I. Kar-Purkayastha²

¹Field Epidemiology Services Victoria, Public Health England, London, UK, ²Surrey & Sussex Health Protection Team, Public Health England, Horsham, UK, ³Environmental Health, Runnymede Borough Council, Addlestone, UK

Introduction: In December 2013, Surrey and Sussex HPT received reports of gastrointestinal illness, including confirmed Campylobacter, following a lunch event at a hotel in Surrey. This event was attended by 151 people with initial reports of 25 guests with diarrhoea and vomiting.

Methods: A retrospective cohort study was undertaken. All attendees were asked to complete a questionnaire, with information on demographics, symptoms and food exposures. Attack rates were calculated and multivariable analyses conducted to determine any association between food exposure and illness. Stool samples were collected to confirm presence of pathogens and on-site environmental investigation was performed.

Results: Of the 151 guests, 102 provided a valid questionnaire (response rate: 68%). Among these, 46 cases were identified (attack rate: 45%). The median incubation period was two days, and 41% of cases sought medical care. Food items associated with illness were

roast turkey (aOR 3.55, $p=0.045$) and turkey jus (aOR 3.02 ($p=0.041$): no association was found with eating chicken liver parfait. *Campylobacter* was detected in 11 out of 14 cases providing stool samples. Environmental investigation did not find non-adherence with regulatory food handling practices at the venue.

Discussion: This outbreak of *Campylobacter* had a high attack rate and epidemiological analysis found that consuming roast turkey and/or turkey jus was the likely cause. Surprisingly, no association was found between chicken liver parfait and illness. This study shows that although chicken liver parfait has often previously been identified as the cause of *Campylobacter* in recent outbreaks, other food items should be equally investigated by outbreak control teams.

04

INTERNATIONAL TRANSMISSION OF HEPATITIS A: EPIDEMIOLOGICAL AND VIROLOGICAL EVIDENCE OF SHELLFISH CONTAMINATION BY A SINGLE INDEX CASE IN A LOW INCIDENCE AREA

*Chris Whiteside*¹, *Laura Dexter*¹, *Chris Williams*¹, *Meirion Evans*¹, *Siew Lin Ngui*², *David Lees*³

¹Public Health Wales, Cardiff, UK,

²Public Health England, London, UK,

³Centre for Environment, Fisheries & Aquaculture Science, Weymouth, UK

Background: Hepatitis A virus (HAV) is known to be transmitted through shellfish consumption, but identification of an individual source case is rare. Two small outbreaks in the Netherlands in 2012 associated with consumption of UK mussels were caused by a unique

strain of HAV. Following international collaboration comparing sequence data in 2013, UK agencies investigated the route of transmission.

Methods: Retrospective analysis identified several UK cases of HAV with the same genomic sequence. Epidemiological and virological information was collated with watercourse topography, sewage systems and meteorological data. Details of mussel harvesting, processing and exportation were gathered via collaboration between national and international agencies.

Results: The UK index case (onset May 2012) acquired HAV in Mexico. The same strain was identified in three members of a local family (onsets July and August), two small outbreaks in the Netherlands (August and November, 9 cases), and a 5th UK case in November. It is likely that HAV-contaminated sewage was discharged into the local mussel-growing area. International depuration practices (post-harvest purification) of filter-feeding shellfish vary, and along with inadequate cooking, may have contributed to the secondary outbreaks.

Conclusions: Epidemiological, virological and environmental evidence support HAV transmission from the index case to the local family via environmental exposure, thence to mussels consumed in Netherlands causing two outbreaks. HAV transmission through shellfish can occur even in low-incidence areas. International collaborations and genome sequencing can now identify specific transmission incidents, enabling agencies and shellfish producers to work together to minimise the risk of transmission of viruses.

05

USE OF MULTIPLE LOCI VNTR ANALYSIS (MLVA) IN IDENTIFYING CASES IN AN OUTBREAK OF SALMONELLA

*Christopher Johnson, Judy Hart
Public Health Wales, Mold, UK*

During July and August 2013 an outbreak of Salmonella was identified in Conwy and Gwynedd by Public Health Wales. By the end of the outbreak cases had been found widely distributed between North Wales (21 confirmed cases) and 10 Public Health England Centres (45 confirmed cases) with 5 separate geographical clusters in England and 2 in Wales. Non phage-typable Salmonella isolates from across England and Wales underwent Multiple Loci VNTR Analysis (MLVA) at the Public Health England Salmonella Reference Service, Colindale. Outbreak cases were defined as those that were non phage-typable Salmonella Typhimurium with a MLVA profile 3-13-13-NA-0211. This profile had not previously been found in the UK and consequently it was possible to link together all cases in the geographically separate clusters to a single common source. We believe that this is the first time an outbreak has been defined by a MLVA pattern in the UK. By examining the common links between the clusters the outbreak was sourced to a manufacturer of cooked ham in Northern England.

06

THE POSITIVE EFFECTS ON RESPONSE RATE FROM OFFERING ONLINE SELF-COMPLETION

*Adrian Wensley, Louise Coole
Field Epidemiology Service, Public
Health England, Leeds, UK*

In 2012 a prospective case-control study of laboratory confirmed pertussis in persons aged 15 and above was undertaken in England. This was initiated due to a marked increase in incidence of pertussis in those aged 15 years and above nationally. Different control recruitment methodologies were used in two phases of the study. Initially controls were asked to respond by reply slip, telephone, text or email to indicate willingness to participate in a telephone interview. In later stages of the study an option was given to self-complete an online survey.

The focus of this study is to explore the effect of the recruitment methodologies on response rate and preference for response method (Yorkshire and the Humber data). The overall control recruitment was 1.04 controls per case. After the introduction of online self-completion the overall response rate increased to 7.5% (95% CI 6.0% - 9.2%) from 5.9% (95% CI 4.2% - 7.9%). The preferred method of response shifted sharply when online self-completion was introduced. Over 80% of controls preferred online self-completion over the other forms of response offered. This preference was consistent in all age groups under 70. In the 70 and older age group no methods were significantly favoured, however online self-completion was still the second most popular option in this group.

Any systematic differences in demographic

characteristics between respondents and non-respondents and respondent contact method will be presented. Practical suggestions on how response rate could be increased will also be discussed.

07

A HEPATITIS C INFECTED HEALTH-CARE WORKER: CHALLENGES IN CONDUCTING A LOOKBACK EXERCISE SPANNING 4 COUNTRIES AND 30 YEARS: THE WALES PERSPECTIVE

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Background: A retired healthcare worker (HCW) who had worked in obstetrics and gynaecology in Caerphilly, performing exposure-prone procedures, was diagnosed with hepatitis C genotype 4, with notification in 2013. The diagnosis was made following presentation with illness post-retirement.

The HCW had worked in Caerphilly for 20 years, and in two other hospitals in Wales, and in the three other UK countries, over the previous 10 years.

Two cases of likely transmission were identified in women with hepatitis C, genotype 4, which were closely matched on phylogenetic analysis to the HCW. They had had obstetric procedures in Caerphilly during the 1980s and 1990s. The UK Advisory Panel for Healthcare Workers Infected with Bloodborne Viruses (UKAP) advised a lookback exercise

covering the entire employment period of 30 years.

Method: A lookback exercise was undertaken, led by Aneurin Bevan University Health Board, for the three Health Boards in Wales, with support from Public Health Wales. Public health agencies in the other UK countries were briefed through regular operational teleconferences, and made their own lookback arrangements.

Results: A total of 4,053 women were invited for screening, of whom 3,326 opted for testing. One additional patient was identified through testing, and another additional patient through hepatology clinic records.

Conclusion: This lookback exercise was complicated by the duration of employment of the healthcare worker and the numbers of hospitals involved across the UK. The lessons learnt in Wales in undertaking this exercise will be shared, to inform future lookback exercises and national policy.

08

ACHIEVING STANDARDISATION IN INVESTIGATING CROSS BORDER OUTBREAKS: DEVELOPING A TOOLKIT IN PARTNERSHIP WITH LOCAL AUTHORITIES

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Background: A cross border outbreak in West Yorkshire (WY) highlighted the need for standardised resources for management of gastro-intestinal (GI) disease including common questionnaires and tools. The GI Liaison Group in collaboration with all Local Authorities

in WY developed a joint protocol to achieve standardisation and efficiencies in outbreak investigation.

Methodology: Current practice was mapped through a review of operating procedures and a baseline audit of variation in practice across the five local authorities (LAs). Examples of questionnaires and tools used across the country were obtained by contacting Regional GI leads across PHE. The protocol was validated with published information on disease specific risk factors. Two workshops were held including local health protection team and EHOs from each LA to agree minimum standards and standard operating procedures.

Results: A standardised protocol for the public health management of GI cases was implemented across the five LAs in February 2014. This included questionnaires, outbreak management tools and minimum standards with response times for managing specific diseases.

Discussion: Implementation was facilitated by partnership working and commitment from PHE and LA colleagues. Workshops proved to be the most useful tool in building consensus and commitment between partner organisations for which PHE has no direct accountability. Commitment was further supported by the need for increased efficiency which acted as a key driver for change. Anticipated benefits to LAs and PHE include a more coordinated response to cross boundary outbreaks, greater quality of information and increased efficiency. Future evaluation will determine if these benefits are realised.

09

HEALTH EQUITY AUDIT OF SECTION 7A SCREENING SERVICES IN PRISONS WITHIN DERBYSHIRE AND NOTTINGHAMSHIRE AREA TEAM

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Background: Since April 2013, it is the responsibility of NHS England, as Section 7A commissioners, to ensure prisoners have access to all National Screening Committee recommended screening programmes. The delivery of such services in secure settings can be challenging and prisoners do not appear to be getting equitable access as outlined in the NHS Constitution.

Methods: A health equity audit was conducted to establish the availability and uptake of screening amongst prisoners in the Derbyshire and Nottinghamshire Area Team and to assess current barriers. The methods included: agreeing priorities and partners; carrying out an equity profile with baseline data collection and analysis; and using the evidence to identify effective national and local action.

Results: The audit showed that some local arrangements were in place for breast cancer, cervical cancer, diabetic eye and antenatal screening, although there are issues with consistency of delivery. No arrangements were in place for bowel cancer and AAA screening programmes. A local pilot of bowel cancer screening in one prison had identified significant barriers to

the comprehensive rollout of these programmes including issues with confidentiality and call/recall.

Recommendations: Nationally agreed pathways and policy guidelines need to be developed with clear failsafe mechanisms for each NHS screening programme within a prison setting including suitable call/recall systems. In addition, a local bespoke implementation plan on how each prison can ensure access to the National Screening Committee screening programmes should be developed, particularly focusing on call/recall and failsafe procedures.

O10

HOW QUICKLY IS IT POSSIBLE TO CONDUCT A CASE CONTROL STUDY? A REVIEW OF AN INVESTIGATION INTO AN OUTBREAK OF CRYPTOSPORIDIOSIS LINKED TO A PADDLING POOL

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The use of online survey tools in outbreak investigations is becoming more commonplace.

There is increasing expectation that analytical studies can be started and completed rapidly once an outbreak has been identified. Each year the number of households with access to the internet, smart phones, and social media means that there is the potential to recruit large numbers of controls and collect control data rapidly and efficiently. However consideration still needs to be given to how this is conducted, public and stakeholder perception and potential biases compared to traditional methods

of collecting control data. There are also pitfalls from rushing too quickly to commence an analytical study that need to be considered.

In this example there was no way to identify a list of visitors to a public park and so local media was used to request assistance from the local population to act as controls. 265 people from the local population responded to the request and enough complete control data to satisfy the power calculation was gathered within 7 days. This required little resource in terms of local PHE or Environmental Health staff in comparison to previous studies and was very efficient but not without some difficulties.

O11

NOVEL SURVEILLANCE AND PATIENT MANAGEMENT SYSTEMS TO ENSURE CONTINUITY OF CARE WITHIN HIGH RISK, HARD TO REACH AND HARD TO ENGAGE POPULATIONS

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Background: People who inject drugs (PWID) represent a public health challenge. PWIDs experience elevated rates of acute and chronic infections and premature death, tend to be socially excluded and, in terms of mainstream health services, represent a hard to reach/engage group. Needle and syringe programmes (NSPs) are an effective intervention for PWID, however, accurate data remains scarce. Public Health Wales implemented the Harm Reduction Database (HRD) Wales in all NSP and related services providing a novel system to promote engagement and continuity of care.

Method: HRD Wales is an anonymous real-time web-based patient management and surveillance system, providing a unique individual record, recording specific risk behaviours and referrals to specialist services. HRD Wales also provides a surveillance system for the provision of Take-home Naloxone, an opioid antagonist. Patients may update their own information with the provider to ensure accuracy and promote engagement.

Results: Annually 10,000 unique patients are engaged with the system, regularly updating risk and related data. Providers report improved engagement and the importance of accurate patient information to optimise harm reduction and early intervention. Public Health Wales HRD was recognised for 'Best Use of IT to promote Patient Safety'.

Conclusion: Use of real-time web-based systems promotes quality care for PWID and potentially other patient groups, facilitates active patient engagement in the registration, identification of health care need and ongoing care. Providers are better informed and therefore more confident to engage. Accurate and timely information is available to assess ongoing need and plan services based on robust evidence.

O12

INVESTIGATING AN OUTBREAK OF LEGIONNAIRES' DISEASE: FROM BINOCULARS TO MAGNIFYING GLASSES

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Background: Twelve cases of Legionnaires' disease (LD) associated with Renfrew in Scotland were notified to NHS Greater Glasgow and Clyde between 14th June and 20th September 2013 with onset of illness over a seven week period from 6th June till 30th July.

Methods: Cases were investigated and interviewed. Wind direction information was obtained and spatial modelling was carried out.

Twelve evaporative cooling systems (ECS) within 6 km radius of the cases were inspected and shock dosed. Six ECS within 1.5 km were also sampled prior to shock disinfection. A further 30 medium and low risk potential sources within the local area were inspected.

Results: There was a statistical link with cases to one postcode area.

The predominant wind direction suggested a source to the North West direction of the cases.

Three or possibly four distinct temporal clusters of cases were identified possibly indicating exposure to an intermittent dispersal source.

Two culture positive cases were identified as *L. pneumophilla* Sg 1 subtype Philadelphia ST 37.

Sampling of ECS within a 1.5 km radius prior to shock disinfection and subsequent follow up sampling did not identify *Legionella pneumophilla*.

No legionellae were found from any other sources.

Conclusion: Given the geographical and temporal link for 12 cases of LD it is likely that a single source emission could account for these.

However, despite intensive investigation, the source of the outbreak was undetected possibly as a result, in part, to the changing weather conditions and intermittent nature of emissions.

O13

LESSONS LEARNED: AN INVESTIGATION OF A TUBERCULOSIS INCIDENT IN A ROMA COMMUNITY

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Background: Roma populations in the UK have increased in recent years. Migration has been driven by historic inequalities and discrimination along with economic factors. Routine TB surveillance data from Europe masks a high prevalence of TB in Roma. Estimates from Spain indicate that the incidence of TB is five times greater in Roma communities compared with the

general population.

Methods: A multi-agency team, including GPs, NHS, Local Authority and PHE managed this TB incident and identified lessons for future work.

Findings: Three cases of TB and 26 cases of latent infection were identified, 57% (27/47) of the Roma community screened positive. Epidemiological and microbiological links to a previous TB outbreak were established; learning from this informed our initial response. Cultural barriers limited the effectiveness of enhanced case finding, although language barriers were reduced through development of multi-language patient information and the use of dedicated interpreters. The stigma of TB and behaviours such as frequent socialising in each other's homes, frequent local and international travel and overcrowded accommodation presented challenges when working with this community. Adopting a high intensity model of enhanced case management fostered relationships between the TB Service and the Roma community which supported understanding of these issues and increased treatment compliance.

Conclusions: The Roma population are at a high risk of TB and increasing Roma populations in the UK require co-ordinated public health action. This is now a timely opportunity to identify Roma population centres, investigate their health needs and consider options for increased screening and BCG delivery.

014

TRACKING A COMPLEX TB OUTBREAK IN A BOARDING SCHOOL OVER A FIVE YEAR PERIOD: IMPLICATIONS FOR CONTROL

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Introduction: Tuberculosis (TB) outbreaks in schools are extremely complex and present public health challenges. 7 cases of TB were notified at a faith based boarding school in Bradford over a period of 5 years. The objective is to track the prolonged outbreak in the school, discuss factors that may have facilitated ongoing TB transmission and highlight control measures instituted in this setting.

Methods: An epidemiological analysis included review of index cases, timelines of notification, links across year groups and strain typing data to describe the outbreak. Analysis of contact tracing and TB screening outcomes was undertaken. Social networking software is used to graphically represent this complex investigation.

Results: Despite extensive contact tracing and follow-up, TB cases were notified in school with alarming regularity. Between 2008 - 2013, mass TB screening was done four times in this school. Whilst majority of cases had similar MIRU-VNTR profile, using strain typing information proved tricky due to missing loci and extra-pulmonary TB cases.

Conclusion: The ongoing transmission of TB in the school over 5 years highlights the need for innovative TB prevention and control strategies in this setting. Control

measures included risk assessment of new school starters within 3 months with TB screening questionnaire to identify active TB cases and risk factors, BCG vaccination history or evidence of vaccination, prompt referral of symptomatic cases to TB services and raising awareness about TB among new students and school leavers. Proactive control measures in such high risk settings can minimise spread and prevent future outbreaks.

015

SOMETHING LURKING IN THE POTTING SHED - TALES OF LEGIONELLA LONGBEACHAE IN SCOTLAND

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Over the last six years Scotland has detected 18 cases of Legionnaires' disease caused by *Legionella longbeachae*. These cases were in Scottish residents exposed in Scotland. During the same time, only three cases have been identified in the rest of the UK and around 37 cases in the rest of Europe.

Legionnaires disease caused by *L. longbeachae* presents as community acquired pneumonia. In a cluster of cases in 2013, six out of seven cases had severe illness and required ITU admission. Cases were 2:1 male:female; had an average age of 67 years; and a high proportion were smokers or ex-smokers and/or had significant underlying morbidity.

Possible sources for *L. longbeachae* include growing media and composted green waste. The majority of cases

were keen gardeners and had multiple exposures to growing media during their incubation period. Environmental investigations isolated *L. longbeachae* from recently used growing media in half of the cases. No common retail outlet, brand, manufacturer or source of composted green waste was identified. Growing media on sale in Scotland is manufactured all over the UK and supplied all over the UK.

L. longbeachae infection is identified by culture, PCR or by serology - these are tests which may not routinely be carried out, especially as urinary antigen testing (usually the first test used if legionellosis is suspected) is negative for cases of *L. longbeachae*.

HPTs and clinicians should be aware of the possibility of *L. longbeachae* infection in cases of CAP, especially in those who are keen gardeners.

O16

TRENDS IN CLINICAL PRESENTATION AND CASE FATALITY OF INVASIVE PNEUMOCOCCAL DISEASE CASES POST-PCV7 AND POST-PCV13 IN THE NORTH-EAST OF ENGLAND

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Background and Aims: The 7-valent pneumococcal conjugate vaccine (PCV7) was included in the routine UK childhood immunisation programme from 2006 and

was replaced by the 13-valent vaccine (PCV13) in 2010. It was anticipated that PCV7 and PCV13 would affect the epidemiology of invasive pneumococcal disease (IPD). This paper describes the clinical presentation and case fatality of IPD cases in north-east England post-PCV7/13 introduction.

Methods: An enhanced IPD surveillance system in north-east England collected data on each case of IPD reported to the North East Health Protection Unit by local microbiology laboratories. Cases included in this study had a specimen date between 1st April 2006 and 31st March 2013.

Results: Over the seven year period, 66% of cases presented with bacteraemic pneumonia, 10% with meningitis and 9% with septicaemia. Between 2006-07 and 2012-13 the incidence of bacteraemic pneumonia fell by 34% (7.9 cases/100,000 to 5.2; incidence rate ratio 0.66, 95% CI 0.53-0.82; $p=0.0002$). The incidence of both meningitis (1.1 cases/100,000 vs 0.8) and septicaemia (0.8 cases/100,000 vs 1.4) remained unchanged. We observed a statistically significant reduction in case fatality rate (CFR) of 47% (22.4% vs 11.8%; risk ratio (RR): 0.53, 95% CI 0.35-0.80; $p=0.0019$). The greatest decrease in CFR was in adults ≥ 65 years from 38.3% to 18.6% (RR: 0.48, 95% CI 0.30-0.78; $p=0.0014$).

Conclusions: There has been a significant decrease in IPD presenting as bacteraemic pneumonia following the introduction of PCV7 and PCV13, but no evidence of a decrease in meningitis and septicaemia. Case fatality has fallen significantly.

017

NEONATAL BCG - IMPLEMENTATION OF RECOMMENDATIONS FROM AN AUDIT OF POLICY AND PRACTICE ACROSS THE YORKSHIRE AND HUMBER REGION

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BCG is currently offered as a selective vaccine programme in England and has associated NICE guidance. In 2011 an audit of policy and practice of the neonatal BCG programme across maternity units in the Yorkshire & the Humber was undertaken. A semi-structured interview was used to determine the systems and process in place in each unit for the identification of babies eligible for BCG, the administration of BCG and process for follow-up for babies not vaccinated in hospital.

The audit demonstrated variation in the implementation of NICE guidance for BCG vaccination in neonates. These included variation in the interpretations of the family history criterion and adoption of indications outside the guidance. Further to this, 25% of units misinterpreted the parents/ grandparents criterion. There were positive developments in provision of vaccine but uncertainties about follow-up and referral for eligible babies leaving hospital unvaccinated.

Recommendations from the audit included the development of a risk assessment and pathway approach to determine the eligibility for neonatal BCG pre-delivery. A voluntary working group was set up in August 2013 to ensure delivery of recommendations. The work required partnership working with colleagues from allied clinical specialities and NHS England.

Following agreement and approval, the risk assessment and pathway is now being implemented within our Trusts. A re-audit is planned for 2015 to ensure clinical quality assurance and quality improvements.

The presentation shows how audit and structures within PHE and NHS England can be used to benefit and protect those at risk of vaccine preventable diseases.

018

ROTAVIRUS VACCINATION - EARLY IMPACT AND HERD EFFECTS

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Rotavirus is a major global cause of acute gastroenteritis. In England and Wales, rotavirus gastroenteritis is responsible for up to 130,000 annual GP consultations for children under five years, with around 13,000 hospitalisations. Rotavirus infections are seasonal and, in the UK, usually occur in winter and spring (January to March). Although individuals of any age can develop rotavirus gastroenteritis, nearly all illnesses occur in children under 5 years of age. On 01 July 2013, a live oral rotavirus vaccine, Rotarix®, was introduced into the UK national infant immunisation programme as a two-dose schedule at 2 and 3 months of age. Although there are strict time windows for administering the first and second dose of vaccine because of a small but significant increase in the risk of intussusception, vaccine coverage by 6 months of age has been very high. Preliminary analysis of the first rotavirus season after the introduction of the programme suggests an 80% reduction in the number of laboratory-confirmed

rotavirus infections. This reduction was observed not only in the age-group eligible for vaccination but also in older, unvaccinated children and adults. Studies on primary care and hospitalisation rates, risk of serious adverse events and molecular characterisation of clinical rotavirus strains are on-going. Thus, the infant rotavirus immunisation programme has achieved very high vaccine coverage despite strict time windows for vaccine administration and has resulted in major reductions in rotavirus infections across all age groups through direct and indirect (herd) protection.

O19

EXPLORING THE SPATIAL RELATIONSHIP BETWEEN OUTDOOR AIR QUALITY, LOCAL HEALTH OUTCOMES AND EMPLOYMENT STATUS USING A GIS TO INFORM LOCAL GOVERNMENT HEALTH PROTECTION POLICY

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Background: Although there is an increasing evidence-base for the association between air quality and adverse health outcomes, the relevance of this at local level is less characterised. Further, the influence of occupational status in defining location of residence and subsequent air quality exposure is not known. This study explores these issues in more detail.

Aims: To understand the relationship and spatial variation between local air quality, health outcomes and employment status to inform local government health protection policy.

Design: An ecological, cross-sectional study of the spatial distribution of NO₂, health outcomes and employment status using a GIS in a northern English city. Air quality patterns were modelled using AIRVIRO. The effects of known confounders were examined including smoking, diet and deprivation status.

Setting: Rotherham, a city in the north of England with a population of around 250,000, close to two major motorways, and experiencing levels of deprivation above the national average.

Results: A spatial variation in air quality across the city was observed. There were statistically significant relationships between outdoor air quality exposure and key health outcomes. Although an occupational gradient was seen, the strongest association evident in individuals that were out-of-work.

Conclusions: Our findings support recent evidence that the health effects of poor air quality are magnified in those aged under 75. We have highlighted substantial spatial variation in air quality exposure across the city which has implications for local government health protection planning programmes.

O20

THERE'S NO FIRE WITHOUT SMOKE! REFLECTIONS ON COORDINATING THE MULTI-AGENCY AND PUBLIC HEALTH RESPONSE TO FIRES

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Background: Large fires can generate considerable public anxiety about the risk to human health and the impact on the environment.

A range of organisations are involved in the management of fires. The initial response is led by Fire & Rescue and other emergency services, supported by local authorities, the Environment Agency and Public Health England. In many cases, even very large fires do not constitute a multi-agency major incident, so formal activation of Integrated Emergency Management command and control structures, including Gold Command and STAC, often do not occur.

Methods: We report experiences from two large fires, which burnt for several weeks, reflect on the roles and actions of agencies involved in the response, and the effectiveness of public health messages.

Results: In both cases, there were no formal multi-agency meetings or coordination in the initial stages as it was not clear which organisation was leading the response. Although public health messages were given to local residents, lack of coordinated incident management

resulted in confusion about roles and responsibilities at the point where the need for clarity is most critical.

Conclusions: If a major incident is not declared, we recommend that the Fire and Rescue Service takes the initial lead role and convenes a multi-agency incident management team at the start of any large fire, or similar incident, to agree a communication strategy including health information to the public. This will result in more timely and effective communication with the affected populations and clearer, joined-up information from the responding agencies.

O21

CALABASH CHALK: A SOURCE OF MINERALS OR SELF-POISONING?

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Intentional and habitual ingestion of chalks, clays and soils is sometimes referred to as geophagia. A variety of chalk and clay products are used therapeutically, by ingestion, in some African, Asian and Western communities. Calabash chalk is one such product, which is commonly used by pregnant women, in certain communities, as an antidote to morning sickness and/or as a nutritional supplement. However, such products have been found to contain relatively high levels of heavy metals which can lead to adverse effects on health, in both the parent and unborn child.

The Food Standards Agency has previously issued advice on the dangers

of calabash chalk. Following several enquiries relating to calabash chalk in London, PHE has developed guidance as part of an initiative to raise awareness of the health impacts of geophagia.

The PHE guidance, which is focussed on the risks to pregnant women, was developed collaboratively between PHE (Health Protection and Operations Directorates), Local Authority environmental health teams and the Food Standards Agency. The poster will define geophagia; identify common traditional remedies or materials used in London, such as calabash chalk; focus on key at-risk groups and highlight the key health risks associated with the ingestion of these products or materials.

O22

WOOD CHIPPING PROCESSES AND DUST: AN EMERGING PUBLIC HEALTH ISSUE?

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Public Health England (PHE) is aware of increasing public concerns related to commercial wood chipping sites across the country. Previously complaints from residents living near such premises were focussed on nuisance due to noise, odours or dust soiling their properties. However recently there have been increasing public concerns related to these sites. Members of the public have contacted PHE concerned about the health impact, particularly recurring upper respiratory symptoms, attributed to dust from these sites.

Adverse health effects have been reported in employees of industries generating high levels of wood dust. However, these adverse effects are due to very high dust exposures over a prolonged period of time and are not directly comparable to the exposures likely to be experienced by the public living near a wood processing facility. There is no robust evidence that clearly indicates adverse health effects from exposures to relatively low levels of wood dust generally found in the vicinity of wood processing sites. In addition, wood processing sites may also be located in areas where there are other industries or activities potentially generating dust and impacting on local air quality and therefore determining the individual contribution from each specific process can be difficult to quantify.

Good operational procedures should prevent any off site releases, however where off site releases occur multi-agency guidance on the investigation and assessment of potential health impacts is required. PHE is working with relevant stakeholders to develop this guidance.

This presentation will discuss the development and content of this guidance.

O23

FLOODING IN ENGLAND IN WINTER 2013/14: THE PUBLIC HEALTH RESPONSE

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England experienced extensive and prolonged flooding during winter 2013/2014 in several areas of England. Flooding is associated with a range of acute and longer-term health

effects. Public Health England's (PHE) objectives were to provide rapid reactive disease monitoring, public health communications, consistent and accurate scientific advice to support local authority colleagues and other responders, and business continuity.

PHE published a range of materials to support the public and local responders, and worked extensively with local and national media to ensure public health advice was widely disseminated, including local radio fillers. Bi-weekly surveillance reports, which brought together, real-time syndromic surveillance, laboratory reports and incident/outbreak reports, were produced. There were no outbreaks of flood-related infectious disease identified by the end of April 2014, but further investigation of the longer term health effects is underway.

Climate change will likely cause an increase in the frequency and intensity of flooding events in England, requiring ongoing public health input.

024

SURMA: THE LOOK OF LOVE OR THE LOOK OF LEAD?

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Traditional, non-commercially produced eye cosmetics such as surma are popular in South Asia, West Africa and the Middle East. Parents may apply such products to their children's eye area daily, starting soon after birth believing it will protect their children's eyes from the harsh sun rays and ward off the "Evil Eye". Surma

is produced by grinding lead sulphide together with other ingredients, and lead concentrations between 18% and 80% have been reported.

Public Health England was notified of a case of lead poisoning in a child when clinical investigations revealed an increased blood lead concentration. The investigation included a risk assessment of the property to identify potential lead sources including environmental sampling of the water supply and surma used by the mother on herself and her children. Laboratory testing of the surma confirmed it contained 21% lead. No other source of lead exposure was identified and the use of surma was discontinued.

Traditional customs and practices persist in migrant families. Challenging cultural beliefs held for centuries requires sensitive handling. It is important, given the potential health impacts arising from lead exposure, that awareness is raised and health professionals are alert to all possible lead exposures. Children are especially vulnerable as lead exposure can impair hearing and cognitive development. Regulation and legislation help in removing lead containing products from sale, but this will have only a limited impact as traditional cosmetics are often obtained via informal networks from abroad. Globally, the hazards of applying surma needs to be highlighted.

025

MAD, BAD OR SAD? MENTAL HEALTH AND THE ENVIRONMENT

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The environment is well recognised to

affect mental health: lead alters behaviour; green spaces improve health. The general public calls Cheshire & Merseyside PHEC help-desk with many varied environmental concerns, contributing to the work-load without necessarily being easy to solve. We examined enquires over 16 months to improve understanding of the concerns and our response.

Methods: We reviewed logged enquiries, paying particular attention to records with abnormal complaints or bizarre behaviours, or where multi-agency follow-up found no physical or rational cause for concern. Records were scrutinised for potential evidence of poor mental health affecting the individuals involved. Focussed literature searches were performed: “chemical”, “sensitivity”, “hypersensitivity”, “parasitosis”, “infestation”, “delusion”, “hallucination”, “paranoia”, “psychosis”, “mental health”, “paraphrenia”, “schizophrenia”, “psychiatric”, “depression”, “mood”, “complaint”, “concern”, “worry” and “public health”.

Results: Several cases with potential psychiatric components were identified (recognising diagnostic limitations), including emotional or psychosomatic problems arising from noise and tinnitus, persecutory delusions (from neighbours with chemicals), partition delusions (being interfered with by chemical invading their home), multiple chemical sensitivity and electromagnetic hypersensitivity (both: non-specific symptoms with exposure to doses below those known to cause harmful effects), delusions about parasites and chemicals giving rise to monosymptomatic hypochondriacal psychosis characterised by a single paranoid delusion with no additional thought disorder.

Conclusions: Case studies were developed to aid staff learning; a structured approach to such enquiries was introduced to reduce staff stress, improve patient compliance and identify appropriate multi-agency interventions.

O26

UK RECOVERY GUIDANCE AND ADVICE FOR THE REMEDIATION OF THE ENVIRONMENT FOLLOWING A CHEMICAL INCIDENT

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Global events have shown that chemical incidents can have huge consequences on human health, the environment and society. It is important that in the event of such an occurrence, the appropriate tools and technical guidance are available to ensure that remediation can be completed quickly and efficiently. Public Health England (PHE) is leading the development of a series of recovery handbooks with support from other Government Departments and Agencies.

The UK Chemical Recovery Handbook was published in 2012[1], and includes guidance and advice on the recovery and remediation of the environment in the post-accident (post-acute) phase and focusses on environmental clean-up methods. The Handbook provides a framework for developing and selecting an effective recovery strategy following a chemical incident, and contains a compendium of practicable, evidence based recovery options for Inhabited Areas, Food Production Systems and Water Environments [2].

Public Health England is also developing a chemical and radiation recovery decision support tool, in collaboration with UK Government Departments and Agencies. It is envisaged that the decision support tool will assist users navigating through the recovery handbooks and provide a consistent methodology to compare remediation techniques and a framework for documenting the parameters, assumptions and information used to reach the decision on how to remediate the affected environment following a chemical or radiation incident.

[1] Wyke-Sanders et al. (2012). The UK Recovery Handbook for Chemical Incidents. Available at: <https://www.gov.uk/government/collections/recovery-remediation-and-environmental-decontamination>

[2] Nisbet et al. (2009). UK Recovery Handbooks for Radiation Incidents. Available at: <https://www.gov.uk/government/collections/recovery-remediation-and-environmental-decontamination>

027

RABIES BOOSTERS: SEROLOGICAL FOLLOW-UP OF BAT WORKERS

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Rabies is an acute viral infection affecting the central nervous system. Clinical rabies is invariably fatal once symptoms become apparent but it can be prevented by vaccination and immunoglobulin.

Although there have been no human cases of indigenous classical rabies in the UK since 1902, a fatal case caused by European bat lyssavirus type 2 (EBLV-2) occurred in 2002. EBLV-2 antibodies are detected in about 2% of British Daubenton's bats (*Myotis daubentonii*). For people who are at regular risk of exposure to rabies, a primary course of rabies vaccine (three intramuscular injections) with a single reinforcing dose one year later is followed by further boosters given every three to five years thereafter.

This study, undertaken between August 2010 and August 2013, was designed to improve the understanding of the serological antibody response to rabies vaccination. Currently WHO recommend that a booster is administered when the rabies virus-neutralising antibody titre falls below 0.5IU/ml. The study aim was to develop more specific advice on the timing of rabies booster vaccinations and to record the rate of adverse reactions due to booster vaccinations.

A total of 150 bat workers, due for secondary or subsequent booster vaccinations during the study period, participated in the study. There were 77 male and 73 female participants aged between 29 and 81 years (mean 54 years). Rabies virus-neutralising antibody titre was ≥ 0.5 IU/ml for all but one participant. A range of adverse reactions were reported by 65 (43%) of participants. The implications of these results will be discussed.

028

IS MENINGOCOCCAL CAPSULAR GROUP W (MENW) AN INCREASING THREAT IN THE UNITED KINGDOM?

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Introduction: Meningococcal group W (MenW) was associated with travel to the Hajj in the early 2000's but is currently rare. Following a recent increase in MenW cases reported to our Health Protection Unit in East Midlands, we undertook a detailed look-back of cases to identify any epidemiological links or risk factors

Methods: Cases were identified from HPZone and a systematic trawl of information carried out. National data were provided by the Meningococcal Reference Unit.

Findings: MenW reports in East Midlands increased from 3 cases each in 2011 and 2012 to 8 in 2013. Of these 14 cases, 13 were White British and eight were female. Age at onset ranged from 3 months to 87 years (median age, 47 years). Only two had significant co-morbidity; one was immunocompromised and one had diabetes. There were no epidemiological links between the cases and only two had travelled abroad prior to illness, but neither had travelled to a high-risk country. Complete information on contacts was available for 11 cases and all eligible contacts received chemoprophylaxis and vaccination. Nationally, MenW cases increased from 30 in 2011, to 42 in

2012 and 76 in 2013, comprising 10% of all laboratory confirmed cases in 2013 compared to only 3% in 2011. Where typing information was available, type 2a sub-type P1.5/P1.2 accounted for >75% of cases.

Conclusion: MenW disease in the UK is increasing year-on-year and, unlike the previous outbreak, is not associated with travel. On-going surveillance will determine whether a change in meningococcal vaccination policy is required.

029

ACTIVE SCREENING AND SURVEILLANCE FOR POLIO AMONG NEW ENTRANTS TO WALES FROM SYRIA

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Background: In October 2013, WHO announced a cluster of cases of acute flaccid paralysis among children in Deir Al Zour province in Syria, later confirmed as acute polio.

In order to detect importation of poliovirus and prevent onward transmission, Public Health Wales instigated active surveillance for poliovirus in new entrants from Syria.

Method: The population at risk was

children aged under 5 years who stayed at least one night in Syria after 1st August 2013. They were identified and invited for health assessment through three routes: a specialist primary care provider for new entrants in Cardiff, dispersal area specialist services, and through wider primary care in Wales.

Stool samples were requested from all who had not received live oral polio vaccine within the preceding 4 weeks. Samples were screened for enterovirus by PCR in Cardiff and enterovirus positive samples further typed at the reference laboratory in Colindale.

All those screened and their household contacts were immunised with IPV and provided with information on polio.

The possibility of supplementing and validating surveillance using sewage testing for poliovirus was explored.

Results: To date, 16 children have been notified, 12 of whom met surveillance criteria. 5/16 submitted stool samples for testing. One was positive for enterovirus.

43 people have received IPV immunisation.

Conclusions: Collaborative working with UKVI, accommodation providers, specialist new-entrant service providers, primary care and the third sector enabled rapid implementation of poliovirus surveillance.

Some children notified were missing information essential for surveillance: completion of documentation by health care professionals is key.

O30

LOCAL PCR FOR MEASLES- IS IT USED? DOES IT UPSET THE NATIONAL SYSTEM?

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Background: Most laboratory testing for suspected measles cases in the UK is through the national salivary testing programme. Manchester introduced local PCR in 2009.

Aim: To determine the rate of laboratory testing for notified cases of measles in Greater Manchester and investigate the impact of local PCR testing on the national salivary testing system.

Methods: Data were extracted from HPZone, the local laboratory and the lab at CIDSC for all measles notifications and tests for Greater Manchester residents, 01/01/2011 to 30/06/2013.

Results: A test for measles infection was requested for 3407 cases. 1642 were notified

82% of notifications had any lab result. Of notifications, 40% had a CIDSC result and 79% had a local result.

Of those with a local PCR result, 49% were notified. If the local PCR was positive, 99% were notified; if negative, only 37% were notified.

The proportion of notifications with a CIDSC test result was similar irrespective of the local result.

Discussion: Local PCR is used extensively, including during a large measles outbreak.

The order of notification and testing is not known. Do clinicians wait for a result then notify or do they notify where they had a higher suspicion. The thresholds for requesting a test compared with notifying are unknown. Measles PCR may have become a routine part of investigation of a febrile child.

Local PCR testing is valued by local clinicians and Health Protection Team as it allows rapid diagnosis or exclusion of measles and thus appropriately targeting of resources.

031

INVASIVE HAEMOPHILUS INFLUENZAE DISEASE IN CHILDREN

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H. influenzae (Hi) serotype b (Hib) was the most common cause of serious bacterial infections in children but is now rare because of a successful national immunisation programme. Consequently, proportionally more cases are due to non-encapsulated Hi (ncHi), which mainly causes pneumonia in older adults. Less is known about the children who currently develop invasive Hi infections.

Public Health England conducts enhanced national surveillance of all cases of invasive Hi disease in England and Wales. Detailed clinical information was obtained for all laboratory-confirmed cases in children <15 years during 2009-2013. This study describes the demographic and clinical characteristics of these children.

During 2009-2013 there were 426 episodes of invasive Hi disease among 425 children. Most (n=344, 81%) were due to ncHi, 39 (9%) serotype f, 27 (6%) Hib, 14 (3%) serotype e, with one each of serotypes a and c disease. Most children with Hib were previously healthy (20/27, 74.1%) and either unimmunised or partially-immunised; there were only two vaccine failures. Meningitis was the most common clinical presentation (17/27, 63%) and all cases occurred in <5 year-olds. The age distribution of children with ncHi infection was different, with 122 cases (35%) occurring in neonates, including 91 (26%) at birth, who presented mainly with septicaemia or bacteraemic pneumonia. Case-fatality was higher for ncHi (62/344, 18%) overall and in neonates (29/122, 24%) compared with 4% (1/27) for Hib.

Neonatal ncHi disease is not well-recognised but contributes to a significant proportion of childhood invasive Hi cases in the post-Hib vaccination era.

032

PSEUDOMONAS EPIDEMIOLOGY IN NORTHERN IRELAND: OUTCOME FROM THE FIRST YEAR OF A UNIQUE ENHANCED SURVEILLANCE PROGRAMME IN AUGMENTED CARE SETTINGS

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Background: Pseudomonas surveillance in Northern Ireland commenced in January 2014 following an outbreak in neonatal settings during 2012. The aim is to describe the epidemiology of Pseudomonas infections in augmented care settings and the epidemiology of

colonisations/infections in neonatal settings.

Methods: The primary outcome was a laboratory confirmed infection from a sterile site in neonatal and non-neonatal augmented care settings and a laboratory confirmed colonisation in neonatal settings only. *Pseudomonas* infections/colonisations, from 29th January 2013-31st January 2014, are described by location, age, sex, timing of specimen and molecular profile.

Results: Twenty-nine isolates were from non-neonatal augmented care settings; 26 were *P. aeruginosa*. Of the 26, the highest proportions were: from haematology (53.8%); >65 years (57.7%); male (76.9%) and; isolated greater than 2 days after hospital admission (69.2%). All molecular types were distinct. Twenty-four isolates representing 18 infants were identified in neonatal settings (3 neonates colonised at more than one site); 18 isolates were *P. aeruginosa* (14 neonates). Of the 14 neonates, the median age was 14 days (range 4 - 91 days), 9 were male and all were detected greater than 2 days after admission. Typing data revealed similarities between three babies. No *Pseudomonas* infections were detected in neonatal settings.

Conclusion: *Pseudomonas* infections in non-neonatal augmented care settings were more prevalent in males and older patients. During the reporting period, no *pseudomonas* infections were reported from neonatal settings despite the identification of colonisations. The early identification of epidemiologically linked cases prompted immediate infection control action with no further isolates detected.

O33

THE PREVALENCE OF A STAPHYLOCOCCUS AUREUS CLUSTER ANTIBIOGRAM IN AUGMENTED CARE SETTINGS IN NORTHERN IRELAND

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Background: A cluster of Panton-Valentine Leukocidin *Staphylococcus aureus* infections (PVL-SA) type t417 has been identified in Northern Ireland. All isolates have a similar antibiogram which has been used to screen potential PVL strains. The aim is to summarise the findings from a SA screening programme in augmented care.

Methods: From 5th August 2013 - 18th October 2013 augmented care settings in the South Eastern Trust were enrolled as they served the main population where this strain has been identified. Patients were screened on admission to the intensive care unit (ICU) and the regional plastic surgery unit (PSU) and weekly thereafter. A proforma was used to collect patient and unit information and admission, re-screen and weekly prevalence for SA and the cluster antibiogram were calculated.

Results: In ICU, the mean proportion of admissions screened was 71.3%, with a SA admission prevalence of 14.3% (prevalence 0.8% cluster antibiogram). The prevalence of *S.aureus* in weekly rescreening was 21.9%; 1.6% for the cluster antibiogram. In PSU, the mean proportion screened was 54.9%. The SA admission prevalence was 21.0% with one case being identified as cluster-related. Weekly rescreens showed there was an overall prevalence of SA 19.2% throughout the ward.

Conclusion: This study provided reassuring evidence that the prevalence of the cluster antibiogram on admission and in-unit is low. This supports the community spread of isolates with this profile. The study also identified learning around best practice for screening on admission to augmented care and issues surrounding definitions for screening, especially in PSU.

034

SPACE-TIME RELATIONS OF CLOSTRIDIUM DIFFICILE CASES WITHIN A HEALTH ECONOMY: A SOCIAL NETWORK ANALYSIS

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Transmission of infectious diseases within healthcare facilities is generally accepted to be explained, at least in part, by close proximity of infected and susceptible individuals.

Awareness of sequences of infections in patients in close proximity to each other is essential for early detection and intervention to prevent further chains of onward transmission.

Close proximity may occur within hospitals, and in community healthcare facilities such as nursing homes.

We have undertaken enhanced surveillance of *C.difficile* cases arising in a county in England to examine the movements of cases between community, nursing homes and general hospitals.

We used Social Network Analysis and the web-based “Timeline” tool to analyse a cohort of 199 *C.difficile* patients, all diagnosed between 2010 and 2012, and all having spent some time in one or other of the two acute trusts.

SQL Server was used to logically process the locations of each patient over time, taking the Cartesian product of their movements to generate a matrix of potential co-locations of the patients.

Network diagrams describing these potential exposures were created, and a series of space-time clusters consistent with the possibility of person-to-person transmission was found within both care homes and the acute hospitals.

These techniques can simplify analysis of a large cohort across a health economy by easily detecting co-location of patients.

It is suggested that early identification and investigation of space-time associations of cases within wards or other shared rooms should be considered routinely to seek to further decrease the still unacceptably high incidence of *C.difficile* infections.

035

A HEPATITIS C INFECTED HEALTH-CARE WORKER: CHALLENGES IN UNDERTAKING A LOOKBACK EXERCISE SPANNING FOUR COUNTRIES AND 30 YEARS. THE ENGLAND, SCOTLAND AND NORTHERN IRELAND PERSPECTIVE

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Background: In 2013 hepatitis C infection was identified in a retired obstetrician and gynaecologist in Wales. Public Health Wales subsequently identified two cases of transmission dating back to the mid-1980s. The UK Advisory Panel for Healthcare Workers Infected with Bloodborne Viruses (UKAP) advised a lookback exercise covering the entire employment period in the United Kingdom; this dated from the 1970s and included 14 hospitals in England, Northern Ireland and Scotland, followed by 20 years employment in Wales.

Method: Public health agencies in all four countries undertook a co-ordinated lookback exercise. In September 2013, details of the lookback were released to the media with the launch of national helplines for women who might have been exposed. Women who had been directly identified from records were invited for hepatitis C testing.

Outcome: There were considerable difficulties in validating occupational history, and many of the English hospitals no longer existed. Overall, few records

remained in these three countries and those that did were of variable quality. There was limited response to helplines and although the uptake of testing in women who were directly notified was high, no further cases of hepatitis C were identified in England, Scotland or Northern Ireland.

Conclusion: The experience in these three countries was in marked contrast to Wales where exposure to the healthcare worker was more recent and far more records were available. The overall risk of hepatitis C transmission was estimated to be very low. UKAP should consider these factors when advising on future lookback exercises.

036

INVESTIGATION OF NEWLY ACQUIRED HEPATITIS C IN HIV-POSITIVE MEN WHO HAVE SEX WITH MEN LEADS TO NEW INFORMATION ON DRUG USE AND HIGHER RISK SEXUAL PRACTICES

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Two recently acquired HCV infections were reported in HIV-positive men who have sex with men (MSM) in September 2013 in Belfast. Both were over 50 years old, with histories of drug use at sex parties arranged via internet social media. This is a newly recognised phenomenon in Northern Ireland.

The aims of the study were case

ascertainment and to improve knowledge of potential risk factors.

A cohort of HIV-positive MSM over 35y with higher-risk sexual behaviour evidenced by diagnosis of an acute STI between 2008-2013 were identified, alerted of risk of HCV infection, offered rapid HCV testing, and administered a questionnaire on sexual and drug use risk factors.

173 HIV-positive MSM over 35 years old were identified. 3.5% (6/173) were HCV-positive. 31/167 HCV-negative cases, and 2/6 HCV-positive cases, had an acute STI in the last 5 years. Two additional recently acquired HCV infections were identified.

Higher risk sexual behaviours combined with use of drugs was reported, including at 'BBCChem+' parties arranged by social media. These involved groups of HIV-positive MSM engaging in high-risk unprotected sexual activities with concomitant drug use. Per rectal administration of drugs, including Crystal Meth and Viagra, prior to anal sex was described. Further details will be presented.

HIV/HCV co-infection is an emerging problem in MSM in Northern Ireland. This study provides evidence of a worrying newly-recognised practice of higher risk sexual behaviours in conjunction with drug use at parties arranged on-line. These behaviours are likely to increase the risk of HCV transmission.

037

CHIKUNGUNYA IN THE CARIBBEAN: REASON FOR CONCERN IN EUROPE?

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On 6 December 2013, public health surveillance confirmed local transmission of chikungunya virus on the Caribbean island Saint Martin, indicating the start of the first documented outbreak of chikungunya in the Americas. Chikungunya is a mosquito-borne viral disease with high epidemic potential, that causes fever and severe arthralgia which may persist for weeks, months or even years.

Since this first report, the virus has spread to several Caribbean islands and to French Guiana. As of 20 April 2014, we estimate the occurrence of more than 27000 clinical cases, 3770 of which were laboratory confirmed, and 6 deaths in the French territories. Weekly incidences of up to 300 cases per 100 000 have been documented. Further dissemination to the Americas and Europe is a significant threat since the Caribbean is a region highly connected to these zones and competent vectors are widespread in the Americas, and in parts of southern Europe.

In France, a contingency and response plan is implemented during the mosquito season, from May to November, in the south of the country where the vector *Aedes albopictus* is established. Enhanced surveillance aims to enable the early detection of all imported and autochthonous cases, and the immediate implementation of vector control measures around each of these cases, to avoid further spread.

Clinicians should be aware that chikungunya should be carefully considered among travelers currently returning from the Caribbean region. Public health authorities should monitor the establishment of the vector in their countries and anticipate the possibility of introduction and spread of the virus in infested areas.

038

ASSESSING THE RISK OF MYCOBACTERIUM BOVIS TRANSMISSION FROM CATS TO HUMAN CONTACTS

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Bovine tuberculosis (bTB) caused by *Mycobacterium bovis* is one of the most significant issues facing cattle farmers in Britain. With a few exceptions, the bTB epidemic in British cattle has not significantly affected the companion animal populations of Great Britain (GB), which are considered 'spill-over' hosts. Since 2006, when *M. bovis* infection in companion animals became notifiable, fewer than 30 cats have been confirmed with *M. bovis* each year in GB.

The risk of cat-to-human transmission of *M. bovis* was previously assumed to be negligible and public health actions in response to notification of feline cases were minimal and sporadic. A recent incident involving ten cats across nine households in one geographically defined area provided evidence of cat-to-human transmission. This information was combined with a review of the literature in order to assess the evidence that exists on the risk of cat-to-human transmission

and to estimate the risk that *M. bovis* infected cats present to human health.

The evidence of cat-to-human transmission of *M. bovis* infection, coupled with the clinical presentation of *M. bovis* disease in cats and the absence of any previous reports of cat-to-human spread, led to the conclusion that the risk of transmission to humans is very low. The precautionary principle suggests that household and other close contacts of cats with confirmed *M. bovis* should be assessed and receive public health advice. Guidance on the management of public health consequences of *M. bovis* infection is being revised to reflect this.

039

MENINGITIS B VACCINATION AND EVIDENCE BASED DECISION MAKING

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Abstract not available.

POSTER ABSTRACTS

P-1

TOWARDS THE DEVELOPMENT OF A STANDARD PUBLIC HEALTH ENGLAND APPROACH TO ACUTE RISK ASSESSMENT FOR LONG-RUNNING FIRES

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Toxic products of combustion are present in smoke; their inhalation poses potential risks to public health. The greater a fire's size and duration, the greater the potential public exposure, public concern and political and media interest. The Environment Agency (EA) recently released fire prevention guidance in response to a number of large and extensive fires at waste sites, noting that such fires could take days or weeks to extinguish. Soon-to-be revised pollution prevention guidelines for controlled burns (PPG28) will likely place a new onus on consultation with public health professionals regarding controlled burn decisions.

Default public health advice during fires is to 'go in, stay in, tune in'. Though sheltering is an effective strategy to reduce public exposure, it cannot be employed indefinitely. When defensive fire-fighting or controlled burn strategies are implemented during long-running fires, multi-agency responders require public health messages from PHE and seek assurances that risks are acceptable.

In such circumstances, the effectiveness of sheltering must be kept under review by public health professionals, who must be ready to challenge a controlled burn

strategy when there is evidence that it could adversely impact public health. This requires active exposure and risk assessment. Risk assessment of acute (short-term) health effects is informed by meteorological forecasts, environmental monitoring, site visits and reports of complaints, symptoms and GP and hospital presentations. PHE must collect this information in a timely manner during fires and use it to inform multi-agency discussions and decisions regarding operational strategies. This poster will outline an approach.

P-2

ENGAGING GENERAL PRACTITIONERS IN ENVIRONMENTAL ISSUES

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GPs are an under-used resource in environmental public health work. Public health professionals can obtain valuable information by engaging GPs.

Incidents usually occur at a fixed location. Local practices can be identified and contacted to establish the number of presentations potentially related to an environmental exposure, and the type and severity of symptoms reported. This information informs multi-agency discussion of impacts and decisions about risk mitigation.

If GPs are briefed by public health professionals regarding the nature and possible public health impacts of an incident, they

can provide consistent information and reassurance to members of the public. A two-way channel of communication is desirable, and there are benefits if public health professionals actively engage GPs in order to obtain information, rather than anticipating that significant information will be provided.

A number of case studies demonstrate the value of engaging GPs in environmental public health issues:

1. A long-running fire, during which PHE regularly briefed GPs and routinely contacted practices and out-of-hours services to establish what impacts were reported by the local population.
2. A landfill associated with local odour nuisance and health concerns, regarding which several agencies briefed local practices in order to promote consistent public liaison.
3. High blood lead levels reported by GPs to PHE, leading to multi-agency investigation and public health intervention.

Future engagement with CCGs and health and wellbeing boards can raise awareness of environmental public health issues at the local level. Standard templates assist liaison with GPs for common types of incident. This poster presents good practices.

P-3

POTENTIAL HEALTH EFFECTS OF VANADIUM IN CONTAMINATED LAND

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Vanadium is a naturally occurring metallic element in the earth's crust. Vanadium compounds are also present in fossil fuels e.g. coal, petroleum oils and shale. In the metal industry vanadium compounds are used as catalysts in various manufacturing processes. The presence of vanadium in soil may be from natural origin or due to anthropogenic activities.

Occupational studies have reported respiratory tract irritation in workers exposed to vanadium compounds via inhalation. Limited human data on oral exposure to vanadium compounds suggests that ingestion of vanadium may cause gastrointestinal effects including nausea, vomiting and diarrhoea. There are no data on carcinogenicity and limited data on potential reproductive effects

Vanadium is not a contaminant that Public Health England (PHE) is commonly asked to provide advice on. However, recently the PHE Centre for Radiation, Chemical and Environmental Hazards has been approached by several local authorities to advise on the health risks of vanadium in potentially contaminated land.

There is no soil guideline value or health criteria value to assess the risks from vanadium in soil. To answer enquiries from

local authorities a preliminary review of the literature was conducted. This identified gaps in knowledge on the toxicology of vanadium. There are limited human data available on the effects of exposure to vanadium. The lack of toxicological data can make it difficult to derive a health-based guideline value.

Here we present the human and animal data toxicology data and the identified knowledge gaps where further research is required.

P-4

FIRES CONTAINING AMMONIUM NITRATE FERTILISER

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Ammonium nitrate fertilisers are widely used by the UK agricultural industry to improve crop yield. Therefore some agricultural land owners will store large quantities of ammonium nitrate fertiliser on their land. Whilst there is guidance and regulations on the storage of ammonium nitrate fertilisers, occasionally they do become involved in a fire, particularly when they are stored with combustible products, such as hay and straw.

There are two main concerns when ammonium nitrate fertiliser is involved in a fire. The first is a public safety issue, as certain types of fertiliser (those that contain over 28% nitrogen) can explode under certain conditions. The Fire and Rescue Service will determine the risk of explosion and, if necessary set up an appropriate evacuation cordon.

The second concern is the impact on public health. Under certain conditions ammonium nitrate fertiliser melts and decomposes resulting in the release of fumes, such as oxides of nitrogen and ammonia, which could potentially result in wider exposure to the local population. Public Health England is asked to provide public health advice on the potential public health impact from a fire containing ammonium nitrate fertiliser.

Whilst internal guidance exists within PHE, further guidance on public health impacts from fires containing ammonium nitrate fertiliser is planned to be produced for wider dissemination. This poster will discuss the public health issues around these incidents using actual incidents as example case studies.

P-5

ENVIRONMENTAL MONITORING IN LONG-RUNNING FIRES

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PHE undertakes public health risk assessment during long-running fires. Environmental monitoring at locations that are representative of public exposure is a vital component of exposure assessment.

Monitoring requirements change over the course of an incident: the initial focus is on rapidly assessing acute (short-term) risks; if a fire continues for a longer-period, it becomes important to assess chronic (long-term) risks.

Air Quality Cell (AQC) arrangements provide for several days' monitoring in significant incidents. However, responsibility

for further environmental monitoring then falls to local authorities. Local authorities' capabilities vary; many lack the resources required to readily undertake monitoring in incidents. Therefore, if undertaken, monitoring is often partly or entirely commissioned from external consultants.

Monitoring must be fit for purpose: health risk assessment. Local authorities seek advice from PHE. Required information encompasses determinants, monitoring locations, duration and methodological approach. Requirements differ depending on whether monitoring is to inform acute or chronic exposure assessment. PHE currently provides ad hoc responses to such requests, and a consistent approach to monitoring and interpretation is required, accounting for uncertainties and confounding factors.

In circumstances where acute risks are not significant, it remains important to assess chronic risks, which have the potential to increase the longer a fire continues. This is currently not well translated into operational practice. Early assessment of chronic exposure is required during fires which one expects will continue for some time, in order to examine the implications of future exposure. This poster presents good practices.

P-6

DEVELOPING AN ENVIRONMENTAL PUBLIC HEALTH SURVEILLANCE SYSTEM FOR ENGLAND

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Environmental public health is concerned

with environmental hazards (all physical, chemical, and biological factors external to a person capable of causing harm), environmental exposure to these hazards, and possible resultant health outcomes (e.g. asthma caused by air pollution). Through surveillance of these factors, new opportunities to trace environmental hazards to health outcomes and vice versa emerge.

Environmental Public Health Surveillance System (EPHSS) is one of Public Health England's (PHE) key surveillance projects aimed at developing a comprehensive and systematic approach to the acquisition, collation and analysis of data and intelligence on environmental hazards, exposures and health outcomes.

In England, no integrated population-based surveillance currently exists that integrates information on different aspects of hazards and facilitates the application of public health principles and measures to reduce harm. EPHSS would exploit PHE's ability to evaluate the health and cost benefits of known chemical environmental hazard interventions. This approach becomes essential to public health practice in an era of shrinking resources and increasing demand.

EPHSS, a web-based multi-agency surveillance system will capture information on hazards, exposures and health outcomes. A range of other collaborating organisations in public and environmental health will be able to access the system. The first phase of the project currently in development will allow users to interrogate information on acute incidents drawn from several existing systems. The second phase will include chronic events and exposure assessment as a hub and network surveillance system.

The poster will outline components of the

new system and benefits to users and stakeholders alike.

P-7

HOW MANY WASTE SITES..? A RECYCLING FIRE THAT SPARKED A LARGE MULTIAGENCY WORK PROGRAMME

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On Tuesday 20th August, 2013 a fire started at a large recycling plant in Greater Manchester. The fire involved 1500 tonnes of refuse derived fuel and unprocessed waste, over an area of 100 metres by 100 metres. The plume of smoke mainly affected the residents of neighbouring LA. The Air Quality Cell was mobilised with subsequent air quality monitoring. Evacuation of one residential area was actively considered due to off the scale readings for particulates. The fire was finally extinguished over a month later.

There were previous on-going significant concerns with another larger site in Greater Manchester, and this fire was a catalyst for multi-agency partner engagement in a strategic approach to manage the risks from these sites. A risk assessment highlighted the large number of waste sites within Greater Manchester, many with a high fire risk. A dedicated multi-agency programme has been established to reduce the risk of such fires, to develop multi-agency EPPR plans for high-risk sites and improve the multi-agency response to such fires.

P-8

SCOPING ENVIRONMENTAL PUBLIC HEALTH

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Cheshire and Merseyside PHE Centre, in collaboration with the other two NW PHE Centres, PHE-CRCE, and NHS partners, has reviewed Environment Public Health (= natural and built environmental issues that impinge on population health), its roles, responsibilities and interaction with partner agencies and the general public, to inform, influence and improve service consistency across Public Health England.

Methods: Under a steering group, we held in-depth interviews and a web-based questionnaire with a range of partners to determine engagement with agencies and the public, ease of responding to environmental issues, good practice and areas for improvements and development.

Results: Interviewees (n=48) almost unanimously agreed that locally based, experienced, interested and motivated personnel in PHE with an understanding of environmental issues, local situations and agencies and the ability to translate technical health information and science into lay language for partners and public were essential. Further development of partnership working was requested.

2/3 of questionnaire responders (n=88) (local authority/public health/other) involved in the interaction between health and environment (built, natural, natural or anthropogenic emergency, disease clusters, planning) were comfortable with these issues; 2/3 who were uncomfortable were uninvolved. NW responders

dealt with more environmental issues than elsewhere. Local authority staff considered all environmental issues to be core or essential to their employer, a substantial proportion (<26%) of public health staff thought environmental issues were not important to their employer.

Conclusions: Areas for possible development were identified and submitted to PHE management.

P-9

WIDER HORIZONS, WISER CHOICES: HOW HORIZON SCANNING CAN BE USED TO PROTECT HEALTH FROM ENVIRONMENTAL HAZARDS

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Horizon scanning is a method used by the Environmental Hazards and Emergencies Department of Public Health England to improve our ability to anticipate, prepare for, and respond to future risks and opportunities. A system has been developed with the Environment Agency to systematically examine and share new developments related to environmental issues that are at the fringes of current thinking. Insights about new and emerging issues are captured using an on-line horizon scanning database which allows information to be analysed and disseminated efficiently. The information gathered is used operationally and strategically. This poster describes the horizon scanning process, and focusses on examples of how horizon scanning can be used at the local level to

improve health protection.

Sandwell has established a multi-agency public health forum which uses the regular outputs from the horizon scanning process (the Environment and Health Scan (E&H Scan)) to consider emerging issues. The E&H Scan is an integral part of Sandwell's Environmental Public Health Tracking programme, the first in Europe and which has received WHO endorsement. An annual report to the Health and Wellbeing Board includes a summary of key information from the E&H Scans. The Director of Public Health regards this horizon scanning as an essential tool in informing the development of public health in the new world of Local Authority responsibilities. The E&H Scan has directly informed a number of initiatives, including the implications of land-fill mining, investing in greening urban environments to improve air quality, and population based biomonitoring.

P-10**THE POTENTIAL FOR ORGANIC CONTAMINANTS TO MIGRATE TO OFF-SITE HUMAN RECEPTORS DURING REMEDIATION**

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Summary sentence: This poster will examine several case studies, where remediation activities on sites containing organic chemicals were identified as having the potential to cause public health impacts or concerns within local populations.

The remediation of land affected by contamination can occur as a result of sites being determined as “Contaminated Land” by Local Authorities, voluntary remediation or through the redevelopment of sites for new uses, usually controlled through the planning regime.

Methods of remediation are varied, and may involve treatment or removal of contaminated soils from site. During remediation there is the potential for contaminants to migrate off-site, as vapours or in dust, and pose a toxicological risk to adjacent existing site users e.g. residents.

This poster will examine several case studies, where remediation activities

on sites containing organic chemicals were identified as having the potential to cause public health impacts or concerns within local populations. The steps taken by Public Health England staff, working with partners, to assess these risks and communicate them to local people are detailed.

P-11**IS WATER QUALITY OF DESIGNATED BATHING WATERS IN CORNWALL ALTERED BY HAVING A FRESHWATER INPUT?**

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Background: The revised EU Bathing Water Directive 2006 is required to be met and reported on annually by member states at all bathing water sites by 2015. In addition to good quality water for bathing to reduce the risk of ill health to humans; clean unpolluted water is also essential for the wellbeing of natural ecosystems.

Methods: A quantitative retrospective study of 82 bathing water sites in Cornwall was conducted. These bathing sites provided a 48% - 52% distribution of sites with and without a fresh water input. Microbial indicators *Escherichia coli* and intestinal enterococci were employed as markers of deterioration in bathing water quality and used to monitor bathing water quality results accordingly. Rainfall, salinity levels and tidal range as potential predictors influencing bathing water quality were also considered.

Findings: *Escherichia coli* and intestinal enterococci distributions differed sig-

nificantly in the bathing waters with and without a freshwater input. The presence of *Escherichia coli* and intestinal enterococci was higher in bathing waters with a freshwater input. Bathing waters with a freshwater input were also more likely to experience at least one week where they fail the directive (for both microbial indicators), compared to bathing waters without a freshwater input.

Recommendations: Recommendations for policy and future research include the provision of electronic signage at all bathing sites to provide detailed, timely and effective communications for the public. Revisions to the sampling strategy include a more stringent sampling calendar. Further research is recommended as to whether to extend the bathing water season duration.

P-12

HEALTH PROTECTION SERVICE QUALITY AND DEVELOPMENT OF A HPZONE-BASED SERVICE PERFORMANCE METRICS SYSTEM

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Background: Clinical services, including public health protection, are facing re-organisation but lack evidence-based performance measurement metrics to inform service re-organisation. The HPA Innovations and Ideas Fund, between October 2012 and March 2013, supported work to develop a specialised performance metrics system that measures trends over time to inform clinical public health protection service commissioning and monitoring.

Aim: To evaluate a model of provisional service metrics for a clinical public health

protection service based on three traditional domains of healthcare service quality - service effectiveness, population safety, public experience, and a newly developed fourth domain of 'Key Record'.

Method: Three disease-types were identified; provisional measures were developed from audit standards, then modified as monitoring variables. Data were collected from HPZone case records of all reported diagnosed incidences of the identified disease-types between October 2011 and September 2012.

Results: Psychometric analysis showed low construct validity, with high inter-domain correlation, indicating the need to refine domain parameters. Descriptive statistics presented meaningful narratives, with clear trends of performance per quarter.

Conclusion: All four performance domains are meaningful. Refinement of domains using Confirmatory Factor Analysis will improve model validity. Data handling stratagem should reflect potential variation in professional judgement across PHE centres.

P-13

HEALTH PROTECTION CLINICAL AUDIT: CASE MANAGEMENT OF SPORADIC PERTUSSIS

*Femi Oshin, Victoria Barns
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Aims: To assess the management of suspected or confirmed cases of Pertussis reported to the health protection team.

Methods: Service standards based on the key recommendations from the HPA 2011 guidance and 2012 update were created and checked with subject experts

and clinical staff. This audit is a retrospective, case review of 100 consecutive probable or confirmed cases against these standards.

Results: 100% cases had a symptomatic date of onset but there was an alternative, differing date in 64% cases. This often had implications for management. Appropriate diagnostic testing was best in patients >12 months old presenting late (95% confirmed serologically), other diagnostic techniques were used less appropriately (50% hospitalised infants tested with PCR, 57% non-hospitalised infants with culture and 40% individuals >12 months old presenting early diagnosed with culture). Transmission assessment took place in 33% cases. An attempt at vulnerable contact identification was evident in 19% cases and all identified vulnerable contacts were offered chemoprophylaxis within 24 hours.

Conclusions: The health protection team is effectively recording appropriate demographic details and excluding vulnerable contacts once identified. Improvements in record keeping, diagnostic test used, transmission assessment, vulnerable contact identification and risk communication are needed. Improvements could be made by ensuring telephone numbers are recorded during initial information gathering, confirming estimated date of onset and not assuming the 21-day management window has expired when dealing with serologically positive results. An easily available reference of appropriate diagnostic tests for different groups could improve results.

P-14

HEALTH PROTECTION CLINICAL AUDIT: LEGIONNAIRES' DISEASE CASE MANAGEMENT

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Aim: To identify whether present health protection team (HPT) management of Legionnaires' cases is in accordance with current guidance and practice.

Methods: Scottish HPN, ECDC, CDC and Australian Department guidance documents trawled. Public health (PH) actions with specific HPT responsibilities identified and reviewed for relevance. Criteria and standards were set within a (health protection) risk management framework.

Results: Criteria 1: Hazard Identification - 95% had onset date and clinical symptoms, and 100% were tested by culture/urinary antigen/serology.

Criteria 2: Exposure Assessment - 83% and 95% had documented two-week history and water-based risk factors respectively.

Criteria 3: Transmission Assessment - 85% with documented 6-month custom query search and 83% had documentation of any visits/overnight stays in hospital within two weeks of onset.

Criteria 4: Risk Mitigation - 78% received education about nature of infection and transmission, 90% had documented contact with EHO and 100% completed national surveillance questionnaire.

Discussion: Hazard Identification - well covered, with the majority including documented diagnostic test, onset date and clinical symptoms.

Exposure Assessment - specific water-based exposures were well documented.

However, some cases did not have the history covering the entire 2-week period. In a busy hospital environment it can be difficult obtaining an accurate two-week history.

Transmission Assessment - All of the cases with no documentation were travel-associated and hence the investigator may have felt the query search was inappropriate given the high chance of infection abroad.

Risk Mitigation - All four cases without documented EHO contact involved foreign travel.

P-15

EARLY EXPERIENCE WITH POSTAL SAMPLING FOR SURVEILLANCE OF OUTBREAKS OF ACUTE RESPIRATORY ILLNESS

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Background: Outbreaks of acute respiratory illness (ARI) are commonly reported in schools and care homes. Virological investigation provides useful surveillance information but sampling can be difficult to arrange. We report experience of an ongoing pilot of postal-sampling.

Method: Following assessment of suspected outbreaks of ARI in care home residents, non-residential schools, universities, a self-swabbing kit is posted to cases by the Health Protection Team (HPT). Nasal swabs are collected by self-swabbing or by parents/carers and posted to the laboratory. Samples undergo multiplex polymerase chain reaction (PCR) for influenza A and B, parainfluenza, RSV, rhinovirus, human metapneumovirus and adenovirus.

Results: Postal sampling has been used in 5 outbreaks (summarised below). Results were obtained within 7 days of report. A causative organism was detected in 100%. Telephone evaluation (Outbreak 5) reported user satisfaction with postal swabbing.

Outbreak	Setting	Swabs collected by	Organism	Interval between outbreak reported & results received
1	Residential home	nurse	Influenza A	3 days
2	Nursing home	nurse	Influenza A	≤5days
3	Residential home	carer	Rhinovirus	≤6 days
4	Nursing Home	nurse	Rhinovirus	≤7 days
5	Primary school	parents	Influenza A	≤5 days

Conclusion: Swabbing by parents or carers appears effective and acceptable. Postal distribution and return of viral swabs directly to the laboratory ensures that appropriate transport media is used and minimises the interval between outbreak reporting and availability of results. This has resulted in timely surveillance of ARI outbreaks in North East England and is a useful adjunct to established surveillance systems.

P-16

WHAT DOES GOOD HEALTH PROTECTION PRACTICE LOOK LIKE?

*Martin Schweiger
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Resources are limited, organisations are increasingly risk averse and the environment is ever more litigious. The critical paradox of needing to show demonstrable good evidence based practice while exercising professional intelligence is now highly exposed. The advent of health protection support systems such as HPZone enable the support of good practice but

only possible if there is agreement about what constitutes good practice.

Reorganisations in each of the 5 Nations have brought together diverse organisations which themselves have grown out of groups of diverse organisations each with their own unique history and culture. This means that there is a rich mixture of practice, even for apparently similar tasks. The 2010 deployment in England of HPZone, as a decision and management support system, made variation explicit.

A disease specific process has evolved that defines good practice in 5 steps.

1. Topic experts and those with front-line experience produce an agreed document that defines good practice.
2. An algorithm of frontline workflow(s) is produced.
3. A Suite of Support Material is produced, with all reference documents, case definitions, prompted actions and disease mapping. This is used to configure HPZone for the relevant disease.
4. Consistency of data entry for critical fields is sought and best practice described.
5. A Sign Off process of seeks to ensure that adequate consultation has been used.

The process is simple to describe but difficult to implement! .

Keeping it simple remains the aspiration but many barriers to simplicity.

P-17

EVALUATION OF HEALTH PROTECTION ELECTRONIC NOTIFICATIONS IN GENERAL PRACTICE

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Introduction: Health protection notification from general practice in England is currently paper based. A six month evaluation ran in 17 general practices in West Yorkshire to evaluate whether electronic reporting would improve the process in terms: data completeness, timeliness of reporting, likeliness to report, user satisfaction, efficiency and the positive predictive value of notification.

Methods: To assess satisfaction and implications for general practice an electronic questionnaire was administered. An audit of notifications was undertaken to assess differences in data completeness between paper and electronic notifications. Timeliness of notification, likeliness to notify and PPV was evaluated by calculating statistical significant differences between the intervention practices and a control group of practices using paper notifications. Efficiencies were calculated for organisations based on time savings reported.

Results: There were no statistically significant differences observed for the likeliness to report, data completeness or positive predictive value of notification between control and intervention practices. The time taken for notifications to be received at PHE was significantly shorter for electronic notifications (1.95 days, 95% CI 1.21-2.68) than for control practices (7.65 95% CI 7.21 - 8.09).

Efficiency savings relating to administration were reported by all organisations involved in the electronic notification process. General practices reported a preference for electronic notifications.

Discussion: Time savings and efficiencies were realised for sending, processing and receiving organisations with no detrimental impact on reporting behaviour and a positive impact on user experience. Electronic processes could see the time taken for notification to decrease allowing for a quicker health protection response.

P-18

DEVELOPING A MODEL OF PUBLIC HEALTH SERVICE PERFORMANCE MEASUREMENT IDENTIFYING EVALUATIVE CONSTRUCTS VALUED BY PUBLIC HEALTH PROFESSIONALS

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Assessing and monitoring service performance provides quantitative evidence of service quality, giving clear directions for improvement. There is a current lack of rigorous performance measures for clinical Public Health Protection service provision. A good model must assess meaningful performance domains and parameters to provide meaningful outcome data. A meaningful parameter will reflect staff conceptualisations of service delivery and valued evaluation constructs and methodologies.

The aim of this research was to identify evaluative constructs utilised by PHE health protection staff in Devon, Cornwall and Dorset. Constructs were identified through a thematic analysis of semi structured interviews with a multisite multidisciplinary sample of PHE staff. Data were

analysed at a semantic level, utilising a theoretical essentialist approach.

Four themes were identified. "A True Case of Protecting the Public Health" describes three interacting constructs utilised by staff to identify threats to public health. "You're Not From 'Round 'Ere, Are You?" identifies factors that influence adaptations to established national processes to ensure continued best practice within the patch. "Have I Made a Difference?" describes how professionals evaluate personal performance at case management level, with three intertwining methodologies - professional judgment, case management tools and National Policies. "Getting On Means Getting Along" demonstrates that staff equate good overall Centre performance with successful interpersonal interactions with stakeholders and colleagues.

Valued methodologies had clear standards with a strong evidence base that acknowledge the role of professional judgment.

Implications on development of a service evaluation model are discussed.

P-19

COLLECTION OF EXPOSURE INFORMATION FROM GASTROINTESTINAL INFECTION CASES - HOW QUICKLY AND COMPLETELY IS IT OBTAINED?

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Background: Obtaining and analysing accurate information about possible exposures a case of gastrointestinal (GI) infection in a timely fashion is essential to identify and control possible sources of

infection.

Method: North East cases of *E. coli* O157, salmonella, cryptosporidium infection referred between April and September 2012 were audited against agreed audit standards about timeliness of follow-up by environmental health officers (EHOs) and use of specific questionnaires. Previous audits had taken place in 2010 and 2011.

Results: Of 278 salmonella cases:

1. 8% were lost to follow up
2. 65% of questionnaires were received within 3 days
3. The correct questionnaire was used for 55% of cases

Of 44 *E. coli* O157 cases:

1. 0% were lost to follow-up
2. 70% of questionnaires were received within 1 day
3. The correct questionnaire was used for 52% of cases

Of 259 cryptosporidiosis cases:

1. 6% were lost to follow-up
2. 64% of questionnaires were received within 3 days
3. The correct questionnaire was used for 83% of cases

Further results by local authority (LA) and year will be shown.

Conclusion: These audits provide assurance about the speed of follow-up and collection of exposure data on cases of GI infection and to monitor changes over time especially when LA resources are being reduced. Few cases were lost to follow-up and most cases had a completed questionnaire returned within the audit standard time.

There was considerable variation in audit results between LAs. The results and

recommendations were shared with LAs and the health protection team to facilitate quality improvement.

P-20

AN OUTBREAK OF AN EXTREMELY RARE STRAIN OF CRYPTOSPORIDIUM HOMINIS INFECTION ASSOCIATED WITH A SWIMMING POOL IN THE NORTH EAST OF ENGLAND

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Introduction: Routine investigation of two cases of cryptosporidiosis by Environmental Health Officers identified that both cases had been swimming at the same swimming pool.

Methods: An outbreak control team was convened to manage the outbreak, instigate further investigations and ensure appropriate control measures were implemented.

Investigations included a risk assessment of the pool using the Pool Water Treatment Advisory Group and Cryptosporidium Reference Unit (CRU) guidance on the investigations of cryptosporidiosis outbreaks.

Results: A further seven individuals with confirmed cryptosporidiosis were iden-

tified with links to the same pool. Five additional probable cases with diarrhoea and exposure to the pool did not submit a stool sample.

The CRU reported that the strain identified (*C. hominis* gp60 IaA14R3) for seven of the confirmed cases was extremely rare. There were a further five cases in the North East of England at the time of the outbreak who were infected with the same rare strain of *C. hominis* but who reported no exposure to the pool.

Conclusion: It is hypothesised that due to issues relating to the filtration system operation, a faecal incident overloaded the normal filtration function and caused persistent environmental contamination leading to infection of nine primary cases over a 7-10 day period, followed by secondary transmission within the community.

No new cases were reported after control measures recommended by the OCT were implemented.

Investigations of cryptosporidiosis outbreaks associated with swimming pools are relatively rare and complex. The lessons identified during this OCT investigation of the pool will be shared.

P-21

LEAF VEGETABLES.....ARE THEY TOTALLY HEALTHY?

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Outbreaks of infectious intestinal diseases (IIDs) attributable to the consumption of raw or cooked vegetables have increased and have been commonly reported. This

study reviews 22 years of data on outbreaks attributed to leaf vegetables with the aim of identifying settings, causative agents and other factors particular to this food vehicle.

Systemic national surveillance of general outbreaks of IIDs in England and Wales has been in continuous operation since 1992. Implicating food vehicles reported to PHE eFOSS are classified according to EFSA recommendations and a description of the vehicle is also collected. Outbreaks that are categorised under vegetables and fruits, and where the description specified leaf vegetables including: fresh herbs and salads were included in the review.

A total of 2797 outbreaks were reported to PHE eFOSS between 1992 and 2013. Leaf vegetables were identified as the implicating food vehicle in 1.1% (30/2797) of these outbreaks. The most common reported causative organism was *Salmonella* sp. (40%; 12/30), of which 41.7% (5/12) were *Salmonella* Typhimurium. Other causative organisms reported were *Campylobacter* sp., VTEC O157, norovirus, *Shigella* sp., and *Cryptosporidium* sp. amongst others.

Forty per cent (12/30) of the outbreaks were national outbreaks affecting a total of 1346 people across England and Wales. Outbreaks were also reported in the North of England, South of England, the Midlands and East of England and in London.

This presentation will outline factors that are particular to outbreaks attributable to leaf vegetables which may help guide outbreak investigations and control measures.

P-22**OUTBREAKS OF SHIGA TOXIN-PRODUCING E. COLI O157 ASSOCIATED WITH CONSUMPTION OF WATERCRESS, UNITED KINGDOM, AUGUST TO OCTOBER 2013**

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In September 2013 an outbreak of Shiga toxin-producing *Escherichia coli* (STEC) O157 infection was detected by Public Health England. Investigations revealed a link to consumption of pre-packaged, washed watercress from one salad producer. However, two microbiologically linked cases occurred in February 2013 who had consumed salad vegetables from a retailer representing a separate supply chain. Trace-back investigations indicated the only commonality between both supply chains was a supplier of watercress seeds. Watercress seeds were tested but STEC was not recovered.

During the outbreak investigation a second, smaller outbreak of STEC was detected. An association with consumption of watercress from the same supplier as the first outbreak was uncovered. STEC isolated from cases were found to be identical on typing to STEC from a water sample taken from a watercress bed at one farm. This watercress bed was in close proximity to an adjacent field containing cattle- the primary reservoir for STEC. The likely cause of this second outbreak was transfer of STEC from the field to the watercress bed either from wildlife entering the watercress farm or run-off water.

While both outbreaks appeared to be resultant of low-level contamination events, investigations highlighted risks in the supply chain. These included seeds as a potential source of contamination, the proximity of livestock and access of wildlife to farms, and the risk of contamination from surface run-off. It is likely that these hazards are applicable to production of many ready to eat salad vegetables and not unique to watercress.

P-23**HEPATITIS E VIRUS ENHANCED SURVEILLANCE IN WALES 2012-2013: IDENTIFYING RISK FACTORS FOR INDIGENOUS INFECTION**

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Hepatitis E is historically associated with travel to endemic areas and from consumption of contaminated food and water. However, the number of UK-acquired cases has been increasing over recent years although the source of infection in these cases remains unidentified. Public Health Wales is collaborating with Public Health England in providing limited enhanced surveillance using standard questionnaires to identify possible risk factors for UK-acquired hepatitis E infection.

Preliminary analysis suggests that in Wales in 2012-13, 74 questionnaires were received from 78 lab-confirmed hepatitis E cases of which 54 were UK-acquired and 16 were travel-related cases (this information was not known in 4 cases). Of the 54 UK-acquired cases, 72% were males, 90% of whom were aged 46 years and older and 41% of cases lived close to an estuary or coastal area. Findings from cases occurring in Welsh residents indicate that 62% handled raw or

uncooked meat, 46% of cases owned a pet and 23% of cases visited the countryside in the 9 weeks prior to illness.

Investigating hepatitis E infection in Wales and possible risk factors may provide a greater knowledge on the local epidemiology of autochthonous hepatitis E cases which is currently limited. This is particularly important given that data on human cases may be underestimated as historically a high proportion of clinicians do not test for hepatitis E virus unless the patient reports a history of recent travel to a hepatitis E virus-endemic region; however recent trends suggest increasing awareness by clinicians in Wales.

P-24

EPIDEMIOLOGY OF CAMPYLOBACTER IN NORTHERN IRELAND, 2001-2013

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Introduction: Campylobacter is one of the most common causes of bacterial food poisoning in Northern Ireland, with the incidence increasing over time. This has placed a significant burden on the health service and the economy. This paper outlines the socio-demographic factors associated with this increase.

Method: Data on positive faecal samples for the period 2001 - 2013 were obtained from laboratory systems. Additional individual level data, linked to Super Output Areas and deprivation indices, were obtained from the Public Health Agency's case management system for the period 2011 - 2013. Population data were obtained from the Northern Ireland Statistics and Research Agency to enable

calculation of rates. Chi squared tests were used to test for significance at the 95% level.

Results: From 2001 - 2013 rates of campylobacter increased by 42%; however, increases varied considerably depending on age group. The smallest increase (2%) occurred in the 0-14 year olds, with the largest occurring in the 65-74 year age group (154%). Rates increased with increasing affluence in the older age groups, but displayed an inverse pattern in the 0-14 and 15-44 age groups. There were also significant differences between age groups in urban and rural areas ($p < 0.001$).

Conclusions: Incidence rates of campylobacter in Northern Ireland have increased substantially in recent years, however this increase has occurred predominantly in the older age groups. Significant differences also exist between age and deprivation and urban/rural split. Further research is required in these older populations to appropriately plan for future public health intervention.

P-25

INVESTIGATION OF A SALMONELLA OUTBREAK ASSOCIATED WITH A HOG ROAST, ENGLAND, MARCH 2013

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Aims: In March 2013, 113 cases of gastroenteritis were reported among 550 guests at a college ball. Investigations were undertaken to identify the source

and vehicle of infection.

Methods: A retrospective cohort study was undertaken, using a self-administered online questionnaire. Cases were defined as persons who attended the ball developing diarrhoeal illness 12-96hrs later. An environmental investigation reviewed food hygiene, cooking practices and supply chain networks.

Results: The cohort study response rate was 70% (383/550) and attack rate 30% (113/383). Univariate analysis demonstrated associations between a number of exposures and illness including 'hog-roast' meat served separately from the main meal (RR=12.4, 95%CI=6.7-23.0, $p<0.001$). Stratified analysis demonstrated that other associations with illness were explained by confounding with hog-roast meat consumption. A multivariable model identified dose response between hog-roast meat and illness.

Eight cases were laboratory confirmed as *Salmonella* Typhimurium DT120M-VLA3-11-11-0-0211. The same strain was identified at the hog-roast meat source farm. Removable oven end-plates may not have been used during cooking; in a trial 66% (12/18) of temperature readings failed to meet 75.0C when removed.

Conclusions: These results strongly support the hypothesis that this outbreak was caused by the consumption of hog-roast meat. Attendees who were male and who drank more alcohol consumed a greater quantity, resulting in a greater likelihood of illness.

Removal of oven-end plates may have caused the hog-roast meat to be insufficiently cooked. The safe use of specialist hog roast ovens should be further investigated.

P-26

IMPACT OF PAEDIATRIC CLINICAL HUS SURVEILLANCE ON CASE ASCERTAINMENT THROUGH THE NATIONAL ENHANCED SURVEILLANCE SYSTEM FOR VTEC IN ENGLAND

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Although rare, Haemolytic Uraemic Syndrome (HUS) is a serious condition and the leading cause of renal failure in children. The principal cause of HUS is gastrointestinal infection by vero cytotoxin-producing strains of *Escherichia coli* (VTEC).

In October 2011, Public Health England (PHE) and the British Paediatric Surveillance Unit (BPSU) launched a paediatric HUS surveillance study, collecting data from reporting clinicians in hospitals in the UK and Ireland. Cases reported through the study who reside in England are matched to the existing National Enhanced Surveillance System for VTEC in England (NESSV).

Between October 2011 and December 2013, a total of 265 notifications of HUS were made to the BPSU from clinicians in England; 204 questionnaires were received, 50 of which were duplicates. Questionnaires are awaited for 61 cases. The majority (90%) of cases (139/154) were also reported to NESSV, of which 85% had confirmed VTEC infection. Of those reported to both systems, just 57% were identified as HUS cases on NESSV. There were 37 HUS cases on NESSV not reported through the BPSU system; how-

ever these may include notified cases for whom questionnaires are awaited.

The BPSU HUS study has enhanced the ascertainment of HUS in England. While NESSV contains detailed exposure and demographic data, the questionnaire is often completed before cases progress to HUS resulting in under ascertainment of disease severity. Additional follow-up of cases in NESSV would provide invaluable data on disease progression and a more accurate measure of HUS rates across all age groups.

P-27

INVESTIGATION OF GASTROINTESTINAL ILLNESS ASSOCIATED WITH OYSTER CONSUMPTION FOLLOWING A MUNICIPAL EVENT IN THE EAST OF ENGLAND

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Background: In October 2013, a municipal event celebrating local produce was held in medium-sized city in England. Following the event, a number of attendees reported being ill, and an outbreak investigation was launched by Public Health England and the local Borough Council on 1 November 2013.

Methods: We conducted a retrospective cross-sectional study of persons who attended the event as either guests or as catering staff. A validated questionnaire developed by the Eastern Field Epidemiology Unit was modified and posted with a pre-paid envelope to all attendees. An

online survey option was also developed. The questionnaires included sections on demographic information, health status following the event and a food recall section. It was hypothesized that consumption of oysters were associated with illness.

Results: Questionnaires were sent to the 236 attendees; 188 (80%) questionnaires were returned. A case was defined as anyone who had one or more of the following symptoms: diarrhoea, loose stools, bloody stools, vomiting, nausea, abdominal pain, headache, and fever. Approximately 30% of those who returned the survey reported illness following the event. In the multivariable analysis, oyster consumption was significantly associated with illness ($p < 0.001$; OR 99.40). No other variables were associated with illness.

Conclusion: Oysters have been identified as a vehicle of transmission in other gastrointestinal illness outbreaks, and this investigation adds to that body of evidence. Outbreaks such as this indicate the need for continued education of consumers about the potential risks of the consumption oysters, particularly for those who are immuno-suppressed or otherwise vulnerable.

P-28**INVESTIGATION OF THE LONGTERM HEALTH EFFECTS FOLLOWING ACUTE INFECTION WITH *CRYPTOSPORIDIUM PARVUM*: AN OUTBREAK FOLLOW-UP STUDY**

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We investigated health sequelae (includ-
ing irritable bowel syndrome, IBS) occur-
ring after resolution of acute *C. parvum*
infection associated with a food-borne
cryptosporidiosis outbreak in England.

197 English residents, aged ≥ 16 years
and diagnosed with *C. parvum* during
May 2012 were invited to complete self-
administered questionnaires (using se-
cure online platform or paper format) at 6
and 12-months after diagnosis.

54 participants were recruited: no sta-
tistically significant difference in mean
age of participants and non-participate
($p=0.18$).

14 males and 36 females completed
the 6-month questionnaire online (mean
age=39.8years). Having accessed the
web-link, only 2 people failed to com-
plete the questionnaire (completion
rate=96%). Four additional females par-
ticipated using paper format (statistically
significantly older, 67.8years). 39 of 54
participants completed the 12-month
questionnaire (retention rate=72%).

Pre-existing IBS was reported by 11 peo-
ple. The severity of acute *cryptosporidi-
osis* did not appear related to pre-existing
IBS: 55% of participants with and with-
out IBS reported acute *cryptosporidiosis*
symptoms as severe. At 6-months, 9
of 54 (17%) reported symptoms which
fulfil Rome III criteria for IBS diagnosis,
2 of whom did not report pre-existing
IBS. At 12-months, 44% of those with
pre-existing IBS reported worsening IBS
symptoms in the year following acute
cryptosporidiosis.

26% of participants reported receiving
no information or advice about *crypto-
sporidiosis*.

We conclude that a secure online plat-
form provides an efficient, accessible and
acceptable method for personal health
data collection.

There is scope for improving communica-
tion between patients and professionals.

The significance of reported IBS and IBS-
consistent symptoms requires further re-
search: a Wales-wide prospective inves-
tigation of post-acute health sequelae is
currently underway.

P-29**AN OUTBREAK OF CRYPTOSPORIDIOSIS IN FARM VISITORS: INVESTIGATING THE INVISIBLE RISKS OF A CLEAN PETTING FARM**

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Background: In April 2013 West York-
shire Health Protection Team (HPT) were
made aware of an excess of *Cryptospori-
dium parvum* positive faecal samples.
Trawling questionnaires identified a com-

mon exposure for 45 cases of a visit to a North Yorkshire petting farm over Easter.

Methods: Environmental inspection was conducted on joint site visits by Environmental Health Officers, Animal Health and PHE staff. Microbiological investigation of human and animal faecal isolates was undertaken. A case control study was conducted to explore the association between infection and a range of exposures. Participants were asked to complete an online Select Survey questionnaire either directly or through an intermediary interviewer over the telephone.

Results: An uncommon subtype (IIaA19G1R1) linked a lamb faecal sample to all the subtyped cases (n=20). Multivariable logistic regression identified that cases were 5.5 times more likely than controls to have eaten without washing their hands (95% CI: 1.51-19.9; p=0.01) and 10 times less likely to report being informed of risk on arrival (OR=0.10; 95% CI: 0.01-0.71; p=0.02). Recommendations to limit lamb contact and provide information leaflets were implemented but no significant concerns were identified.

Conclusions: Contact with lambs in peak excretion periods, lack of advice and non-compliance with hand washing are associated with risk of cryptosporidiosis in open farm visitors. Such effects may be compounded by a farm's clean appearance, leading to reduced risk perception and reduction in risk avoidance. This highlights the public health importance of effectively communicating risk, both on individual farms and at a national level, to farm visitors.

P-30

RECOMMENDATIONS AND IMPLICATIONS FOR PRACTICE FOLLOWING TWO OUTBREAKS OF CRYPTOSPORIDIOSIS ASSOCIATED WITH BOTTLE-FEEDING OF LAMBS AT PETTING FARMS

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Background: Two investigations were conducted into outbreaks of cryptosporidiosis associated with bottle-feeding of lambs at petting farms / visitor attractions in the Devon, Cornwall and Somerset (DCS) Public Health England Centre (PHEC) geographical area.

Aim: This presentation describes the challenges faced by PHECs when conducting such investigations and presents the lessons learnt.

Methodology: The response to both investigations was coordinated by the respective outbreak control teams (OCTs). Case definitions were developed and case finding was undertaken. Microbiological investigation of human and animal isolates was undertaken and joint site visits between Environmental Health and PHE conducted.

Results: In addition to reported illness and suspected cases, three cases of *Cryptosporidium* were confirmed from one outbreak and four from the second. In both outbreaks there were reports of illness in the lambs during the period of bottle-feeding activity, however, lambs had not been removed from public access. Laboratory confirmation of zoonotic transmission was inconclusive but site visits revealed poor separation of contact and non-contact areas, inadequate hand washing facilities, poor supervision

and ineffective signage resulting in the potential for transmission of pathogenic organisms.

Conclusion: Despite publicised findings and updated legislation from recent national outbreaks, it appears that measures to reduce the risk of infection on petting farms are not being implemented consistently. Further collaborative work between DCS PHEC and Environmental Health will seek to address this locally. Recommendations were circulated to all involved utilising the opportunity to reinforce and disseminate best practice and update policy for the future.

P-31

AN AUDIT OF THE MANAGEMENT OF GASTRO-INTESTINAL OUTBREAKS IN CARE HOMES IN CORNWALL AND THE ISLES OF SCILLY, DEVON, DORSET & SOMERSET

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Background: In today's health and social care settings there is a need to ensure minimal disruption to services and maximise the ability of organisations to deliver safe and effective services based on local risk assessment.

Aim: This evaluation underpinned the development of the Devon, Cornwall and Somerset (DCS) Public Health England Centre's (PHEC) evidence-based policy for the management of gastrointestinal outbreaks in care homes.

Methodology: Two methods of follow-up were employed across the DCS PHEC geographical area between November

2012 and February 2013. Method 1 incorporated standardised follow-up with risk assessment at prescribed intervals with copies of guidance and a standard letter provided. Method 2 involved follow-up at a frequency deemed necessary based upon a risk assessment by the investigating officer. A case definition was developed and exclusion criteria applied. Data on descriptive, process and outcome measures was collected. Statistical analyses were carried out using Microsoft Excel and Minitab.

Results: There was no evidence for a significant statistical difference between the two methodologies in terms of both process and outcome measures e.g. length of outbreak and the numbers of residents and staff affected. However, Method 1 resulted in significantly less health protection resource committed to outbreak management and follow-up.

Conclusion: This evaluation resulted in a standardised policy for follow-up of gastrointestinal outbreaks implemented across the counties of Devon, Cornwall & Somerset which struck a balance between the prevention and management of infection of infectious gastroenteritis and maintenance of organisational efficiency for both the home and DCS PHEC.

P-32

MULTI-CENTRE TEAM TENACITY: IATROGENIC HEPATITIS B CASE REVIEW

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Background: A 39 year old female was found to have rising liver enzymes following a liver transplant for autoimmune hepatitis. Subsequent investigation identified acute hepatitis B infection.

Aim: To describe the results of a review carried out by both health protection teams (HPTs) involved in case follow-up, presenting the challenges faced and lessons learnt by HPTs when conducting multi-site investigations.

Methodology: Internal multi-site review was conducted of the actions completed for this case, benchmarking against national guidance.

Results: Contacts were tested and found to be negative for hepatitis B. A look back at healthcare workers (HCW) involved in aftercare identified no invasive procedures following transplantation.

Pressure from HPTs resulted in the initiation of an investigation at the trust where the transplant had been carried out. Before screening of transplantation HCWs could begin, it was discovered that the donor organ was hepatitis B core antibody positive.

Case review revealed delays in sharing information that may have prolonged identification of the transmission route. Formally establishing an incident management team may have reduced delays.

Conclusion: This review highlighted effective communication between HPTs in following national guidance to identify an unlikely route of transmission. Timely communication from NHS trusts to members of HPTs would have reduced delays and may have led to a more rapid identification of transmission route. Utilisation of evidence to generate likely hypotheses, together with the courage to exert continued pressure despite a lack of engagement from involved NHS trusts, eventually identified the infection source.

P-33

INFECTION CONTROL MEASURES IN ZANJEER ZANI: A COMMUNAL RELIGIOUS RITUAL THAT INVOLVES BLOODLETTING

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1. Introduction: there is limited evidence around infections associated with religious rituals that involve bloodletting. Zanjeer Zani is the process of self-flagellation using a chain as part of a religious ceremony that is observed particularly by the Shiite Muslim on the anniversary of Imam Hussain's death (Ashoura). Adult males use a variety of sharp instruments (e.g spiked chains) to cause bleeding. A public health concern of this activity is the sharing of sharp instruments amongst participants and the potential for transmission of blood borne viruses (BBV). This presentation discusses the interim infection control measures to reduce the

risk of infections that may be associated with this practice which was prompted by a local response to the practice in a mosque.

2. Methods: this was based on literature review and stakeholder consultations. For example, extensive discussions were carried out with religious leaders, health protection professionals and the Local Authority.
3. Results: no guidance was found in the literature search. A set of interim infection control guidelines were produced to a advice on reducing the risks of BBV transmission associated with the practice.
4. Discussions: We believe this is the first set of infection control guidelines developed for this purpose. With no published research on this ritual, we applied the basic principles of infection control from the national tattooing and body piercing guidance.
5. Conclusion: Bloodletting activities in shared spaces are not recommended due to the risk of BBV transmission. Lack of evidence in this field highlights the need to further research into this activity to inform future national policy.

P-34

AUDIT OF COMPLETION OF SCREENING AND VACCINATION OF HOUSEHOLD CONTACTS OF WOMEN DIAGNOSED WITH HEPATITIS B IN THEIR ANTENATAL PERIOD IN NORTHERN IRELAND DURING 2012

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Pregnant women are screened for hepatitis B as part of the Antenatal Infection Screening Programme (AIS). GPs of hepatitis B positive women are advised to test and vaccinate household contacts for hepatitis B. Monitoring demonstrates good uptake of vaccination and serology for infants, but follow up of contacts has not been audited. This study aims to assess completeness of follow up of cases and contacts.

Public Health Agency (PHA) records of women diagnosed with hepatitis B through the AIS in 2012 were examined to assess case follow up. Completeness of testing of contacts was assessed using Regional Virus Laboratory data. Completeness of vaccination of contacts under 18 years of age was assessed using Northern Ireland Child Health System records.

GPs were advised to test and vaccinate contacts in all (36/36) cases. 86% (31/36) of cases had named household contacts listed; 75% (27/36) had a named adult partner recorded. 53% (38/72) of contacts had HBsAg performed, 13/38 following PHA contact. 4/13 had positive HBsAg results: 2 siblings, and 2 adult partners. An additional 5 contacts had anti-HBs Ab checked rather than HBsAg. 56% (20/36) of contacts under 18 years

completed 3 or more doses of HBV vaccine. No additional doses were given post PHA contact.

Discussion: PHA intervention increases testing and detection of HBV in household contacts. It is ineffective in increasing vaccination rates in under 18s. Written information to GPs should be revised and a specific laboratory request form developed.

P-35

WHY IS SCABIES SUCH A CHALLENGE IN RESIDENTIAL CARE HOMES FOR THE ELDERLY? A REPORT OF OUTBREAK INVESTIGATIONS IN THE SOUTH EAST OF ENGLAND

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Scabies outbreaks are common in care homes for the elderly. Diagnosis is challenging as scabies in immunocompromised and elderly patients may present atypically. Outbreaks require mass treatment of all cases and contacts with scabicide lotion.

We investigated seven outbreaks reported to Surrey and Sussex Health Protection Unit between November 2012-April 2013 using a semi-structured survey administered to managers, staff and affected residents.

39 resident and 29 staff cases were re-

ported, including three cases of crusted scabies. Attack rates among residents ranged from 2-50%. The median time from symptom onset to diagnosis was 7 days (IQR 2-47), and diagnosis to first scabicide treatment 4 days (IQR 2-6).

Most outbreaks were attributed to avoidably late diagnosis of the index case as: GPs were reluctant to visit homes and diagnose scabies; symptoms were confused with other skin conditions such as eczema; and specialist dermatological support was unavailable. Coordination of mass treatment was logistically difficult as it required liaison with several prescribers and pharmacies, and managers reported inconsistent and insufficient prescribing. Staff reported that managing mass treatment was stressful with concerns about residents with dementia who were unable to understand the intrusive and embarrassing treatment process. All homes incurred additional costs including staff overtime, treatment costs, lost admissions, cleaning and laundry.

Our findings illustrate the need for specialist support and novel diagnostic tools to ensure the early and accurate diagnosis of index cases to prevent scabies outbreaks in care homes. Improved diagnostic approaches for primary care and systemic treatment are research priorities.

P-36**AN EVIDENCE BASED APPROACH TO TACKLING CLOSTRIDIUM DIFFICILE INFECTION ACROSS THE LOCAL HEALTH ECONOMY: OVERCOMING BARRIERS TO LOCAL SURVEILLANCE**

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Background: It is recognised that hospital *Clostridium difficile* infection (CDI) rates are related to wider community rates. An in-depth analysis of the local epidemiology of CDI is required to implement an evidence-based, system wide and collaborative approach to reducing CDI.

Aims: The aim of this initiative was to explore local patterns of CDI risk factors within Acute Trusts and the community in Bradford and Airedale District. We explore how to achieve this against a backdrop of new infection control structures, complex information governance between NHS and non-NHS organisations, and disparate data collection.

Methods: Existing CDI surveillance systems and databases were mapped across Bradford and Airedale District. Data for 2007-2013 were collected from the national HCAI Data Capture System and hospital infection control teams.

Discussion: Analysis showed falling rates of community and hospital acquired CDI, a falling average age, no clear seasonality, and significant variation in GP practice rates.

Within the District 15 separate unlinked databases hold information about CDI (distributed between NHS Trusts, Laboratories, a Commissioning Support Unit and the Local Authority).

A single surveillance platform using a locally agreed minimum dataset has been recommended. Anticipated benefits are identification of high incidence localities and GP practices and linkage of CDI cases to risk factors (e.g. antibiotics, health-care and environmental exposure, co-morbidities and ribo-typing).

Barriers include:

1. how to ensure safe transfer and storage of patient data outside the NHS
2. lack of a single organisation able to host, manage, quality assure local surveillance
3. overlapping geographical footprints of NHS and Local Government organisations

P-37**THE RELATIONSHIP BETWEEN THE BURDEN OF ANTENATAL INFECTIONS AND FAMILY ORIGIN; A REVIEW OF DATA FROM 14 MATERNITY PROVIDERS IN YORKSHIRE AND THE HUMBER**

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A national programme for the screening of pregnant women for infections which could impact on their babies is well established in the UK. The programme has been successful in contributing to the reduction in the incidence of vertical transmission of HIV and Hep B particularly by directing at risk pregnancies to appropriate interventions. Summary information on uptake of screening and proportions of those screened with evidence of infection is published annually at local and national levels.

In Yorkshire and the Humber additional

data is collected alongside the standard information set from the family origin questionnaire which is completed with women booking for pregnancy care. Two years data on family origin has now been analysed.

Results: The highest burden of infections with a potential for vertical transmission is among women of African or of African - Caribbean origin. (75% of HIV infections and 20% of hepatitis B infections) Women of South or South East Asian origin have the next highest burden although this is predominantly hepatitis B infection, where this group account for 60% of affected pregnancies.

Understanding the distribution of these infections by family origin can help inform programmes for raising awareness and prevention activities and also provides a window on changes in epidemiology in the wider community.

P-38

PUBLIC HEALTH MANAGEMENT OF A COMPLEX CASE OF PVL-MRSA IN A PREGNANT FEMALE WITH OPEN VULVAL SORES

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Aims: We describe the complex management of a pregnant female with open vulval sores diagnosed with PVL-MRSA shortly before delivery. Arrangements required for mother, baby, four children (two disabled), father and carer within family unit. Learning points included management/support of complex PVL cases in the community with the roles and responsibilities of primary care in new NHS

setup requiring further clarification.

Methods: Initial investigations identified need for comprehensive, multidisciplinary strategy to minimise risks from PVL-MRSA for mother and baby in relation to antibiotics, decolonisation, IPC arrangements and method of delivery. Multi-disciplinary teleconferences held.

PVL strain typing indicated Indian strain dubbed the 'Bengal Bay clone' showing resistance to erythromycin and clindamycin in its lineage, reducing antibiotics treatment options.

Family history revealed previous infections with abscesses/boils so prompt swabbing and decolonisation required to eliminate carriage.

Results: Baby delivered 9 days post EDD via C-section despite vaginal birth being preferred option. Mother and child well post-delivery and IV antibiotics given. Swabs taken post-delivery negative.

Swabbing and decolonisation of family proved problematic with difficulties finding healthcare professionals to undertake swabbing and conflicting reports as to whether family decolonisation had occurred leading to delayed discharge of mother and child. Swab results indicated one child with MRSA who later attended hospital with an infected PEG site.

Conclusion: Investigation of a single case of PVL-MRSA was resource and time intensive. Inability to determine decolonisation status of family led to delayed discharge and breakdowns in communication. Language and difficult family issues added to complexity of situation.

P-39**FIRST COMMUNITY OUTBREAK OF ESCHERICHIA COLI CONTAINING NEW DELHI METALLO-BETA-LACTAMASE-1 IN SCOTLAND, AUGUST - NOVEMBER 2013**

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Introduction: We report 3 confirmed cases of Echerichia coli containing New Delhi Metallo-beta-lactamase-1 (NDM-1) urinary tract infection in Scotland between August and November 2013. There have been 12 Scottish isolates of this organism since 2007, mostly associated with acute settings, Carbapenemase-producing organisms are resistant to most commonly-used antibiotics and may soon pose a significant public health problem.

Methods: Cases were identified by the local laboratory and confirmed by ARMRL, Colindale. Local surveillance was increased.

Epidemiological investigation was accrued out using standard methods. Since no specific questionnaire was available for community outbreaks, a new form was developed based on the existing Public Health England acute questionnaire.

Results: Plausible links were identified: a locum doctor may have been the route by which the organism was introduced into the area and transmitted to the index case; there was a strong epidemiological link of a dental surgery.

Conclusions:

1. It is unusual to have a community cluster of this rare organism in small area. There have been cases in England and this may represent

the spread of the problem into Scotland

2. Attendance at dental surgeries and similar community healthcare facilities may be an under-recognised route for the spread of infections such as these.
3. Continued surveillance efforts are important across Scotland, and the UK as a whole
4. Antibiotic stewardship in clinical practice is vital in limiting the spread of these highly resistant organisms
5. Regulation of the use of antibiotics in agriculture should be considered as this may be an important factor in the development of resistant organisms

P-40**SEXUALLY TRANSMITTED INFECTIONS IN OLDER PEOPLE: ARE RATES STILL INCREASING?**

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Background: Between 1996 and 2003 rates of selected sexually transmitted infections (STIs) increased in older people (those aged 45 years and over) in the West Midlands. This study examines whether the trend has continued over a more recent time period.

Methods: Analysis of the West Midlands enhanced surveillance data from 2003 to 2012 was undertaken. Selected STIs were anogenital herpes, anogenital warts, chlamydia, gonorrhoea, HIV and syphilis.

Results: From 2003 to 2012, 10,958 selected STIs were diagnosed in older people. In 2003 this group represented

4.4% of selected STI diagnoses and by 2012 this had risen to 6.2%. A significant ($p < 0.05$) increase in diagnosis rates for all selected STIs combined was also noted between 2003 and 2012. A similar finding was observed for each individual selected STI other than syphilis and gonorrhoea. Overall diagnosis rates for males and females and for individuals aged 45-49, 50-54, 55-59 and 60 and over were also significantly higher in 2012 than in 2003.

Conclusions: These results indicate that the increasing trend in rates of selected STIs in older people is continuing. It cannot be discounted that this reflects improved access to sexual health services but it may well be that sexual health improvement messages are still not reaching older people. Effective sexual health promotion and education campaigns that specifically target older people are needed to reverse this trend.

P-41

TB AMONGST HEALTHCARE WORKERS IN SCOTLAND, 2000-2012

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Introduction: Historically, healthcare workers are believed to have an increased risk of TB. We aim to analyse more recent data on TB amongst HCWs in Scotland.

Methods: Since 2000, TB cases in Scotland have been notified to the Enhanced Surveillance of Mycobacterial Infections (ESMI) scheme including information on occupation and country of birth. All TB cases reported to ESMI and recorded as HCWs from 2000-2012 were analysed.

Rates were calculated using official statistics on the number of HCWs employed in NHS Scotland.

Results: Few TB cases were reported as being a HCW (202 cases; 4.1%), two thirds of which were known to be born outwith the UK (120/174; 69%). The rate of TB amongst HCWs was 9.8 per 100,000 population including GPs, which is higher than the rate of TB in Scotland during the time period (8.0 per 100,000 population). When adjusted for place of birth, the rate of TB amongst UK born HCWs was 3.3 per 100,000 population and the rate of TB amongst non-UK born HCWs was 120.7 per 100,000 population.

Conclusions: UK born HCWs have a similar risk of TB to other UK born individuals but non-UK born HCWs have a much higher risk of TB than the rest of non-UK born population, with more than double the rate of TB in this group. As the rate of TB among non-UK born HCWs is similar to the rate where they were born, this suggests that being a HCW is not a risk factor for TB in Scotland.

P-42

DETECTION OF UNUSUAL LEGIONELLA SPECIES IN TAYSIDE, SCOTLAND

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Background: Since 2011 a marked increase in the number of unusual legionella cases notified to the NHS Tayside Health Protection Team was observed. Raised single or paired serology titre results for organisms such as *L. gormanii*, *L. bozemanii* and *L. anisa* were noted. There was limited information to assist

public health interpretation and environmental management.

Aim: To determine the implications for Public Health action of unusual serology results.

Method: A Problem Assessment Group was convened with representation from National Services Scotland, local laboratories, the reference laboratory and NHS Tayside. Data informing the current local and national picture for legionella notifications were sourced from ECOSS (The Electronic Communication of Surveillance in Scotland).

Results: NHS Tayside had a notably greater number and rate of positive serological results than other Scottish Health Boards.

Discussion: The results suggest the higher rate may be due to local protocols for the investigation of community acquired pneumonia (CAP). The identification of single titres of legionella species may reflect historical subclinical infection. A single or a significant rise in titre for unusual species alone would not indicate a confirmed case as defined by the European Centre for Disease Prevention and Control definition. Isolation of *Legionella* spp from respiratory secretions is required to confirm active infection. Local laboratories are now withholding reporting until receipt of a second serological sample.

Conclusion: Legionella serology results will be monitored and further information about cases will be obtained to increase understanding of clinical response and cluster identification.

P-43

DEBUNKING THE DEPRIVATION MYTH - FLU VACCINE UPTAKE IN BIRMINGHAM GP PRACTICES FOR 2012/13 AND LINKS WITH DEPRIVATION

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Seasonal flu has a significant impact on primary and secondary healthcare, but despite significant effort to increase flu vaccine uptake, rates remain low. In Birmingham, uptake falls short of NHS England's targets. In the 2012/13 flu season, uptake was 72.8% for those 65 years and over (75% target) and only 52.9% for those under 65 years in clinical risk groups (70% target).

Despite research showing the contrary, there is continuing belief that deprivation is linked to low vaccine uptake. This research investigated deprivation association with low uptake in Birmingham, a multi-diverse city with high levels of deprivation.

The data for flu vaccine uptake in identified under 65 years at-risk groups and over 65s in GP practices in Birmingham (n= 204) was collected, with help of Public Health England (PHE) and Birmingham and Black Country Area Team, from the national ImmForm database. GP practice-level vaccination data for the 2012/13 flu season was mapped against deprivation rates (IMD2010 scores at LSOA and GP level) using ArcGIS.

Associations between uptake and deprivation rates were also calculated using STATA. In the over 65s, there was no statistical association found. Although a slight positive correlation between depri-

vation and uptake was found in the under 65s at-risk groups, there was extensive variation, thus rendering it of little clinical significance.

This research illustrates that uptake in Birmingham is not significantly associated with deprivation. This reinforces the message of the GP Practice Checklist 2012/13 developed by DoH, that the main influencing factors of flu vaccine uptake are within GP practices themselves.

P-44

DELAYS IN THE DIAGNOSIS OF TUBERCULOSIS: AN AUDIT OF THE TIME TO TREATMENT IN LEEDS AND BRADFORD

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Background: Delayed diagnosis of tuberculosis (TB) is associated with increased morbidity and mortality, and has wider public health implications due to increased transmission of disease. We audited TB cases notified in Leeds and Bradford between January and September 2012 to understand the extent of delays to diagnosis and identify factors contributing to patient and healthcare delays.

Methods: Audit standards were based on evidence from a literature search and results of a survey distributed to West Yorkshire TB teams. Data was extracted from the Enhanced Tuberculosis Surveillance (ETS) system and regional quarterly cohort review meetings. Semi-structured interviews with General Practitioners gathered qualitative data on the reasons for delays.

Results: 190 cases of TB were notified in September-January 2012 in Bradford and Leeds. Median patient, total healthcare and total delays were 31 (1-1340), 49 (1-3521) and 91 (6-3528) days respectively. Audit standards were met with regards to patient (<30 days), total healthcare (<30 days) and total (<60 days) delays in 16.3%, 25.3% and 25.3% of cases respectively. Median first healthcare and TB service delays were 45 (0-3413) and 10 days (1-174), and standards were met (<15 days) in 14.2% and 47.4% respectively. Limited data from GP interviews revealed inaccuracies in reporting delays.

Conclusions: Targeted patient and healthcare TB education is needed to reduce delays and improve skills in promptly recognising TB by first healthcare providers. Further work is required to assess healthcare barriers to prompt diagnosis in primary care, and accurate reporting is needed to improve data quality of the ETS system.

P-45

A PRELIMINARY STUDY COMPARING TRENDS IN INFLUENZA-LIKE ILLNESS AND ACUTE RESPIRATORY INFECTION CONSULTATIONS IN GENERAL PRACTICE IN-HOURS SERVICES AND OUT-OF-HOURS SERVICES

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A variety of data sources collated annually by the Public Health Agency provide information on respiratory disease and timing of activity. Influenza-like illness (ILI) and acute respiratory infection (ARI) con-

sultations in primary care were obtained by automated extraction, from all general practitioners in-hours and out-of-hours (OOH) services across Northern Ireland. The OOH service may provide an earlier indication of activity than in-hours service as it is operational for longer periods.

We examined ILI and ARI trends in GP in-hours and OOH over a three year period.

Method: Weekly aggregate data on ILI and ARI consultations, stratified by age-group were extracted from both services for the years 2010/11, 2011/12 and 2012/13. Differences in peak activity periods were observed using longitudinal graphs and proportional estimates.

Results: The peak week for ILI activity was one week earlier in the OOH than the in-hours service in two of the three years. In contrast the peak week of activity for ARI was one week later in the OOH than the in-hours service. ILI consultations were a much lower proportion of all in-hour and OOH consultations (1%) than ARI consultations (15%).

Conclusion: This preliminary study suggests that OOH services may provide a slightly earlier indication of ILI activity than the in-hours service. Conversely, indicators for ARI appear earlier in the in-hours service, possibly due to the age-groups accessing these services. The low proportion of consultations due to ILI may indicate the effectiveness of the public health message to remain at home when ILI is suspected.

P-46

A QUALITATIVE STUDY EXPLORING AWARENESS AND ATTITUDES OF TUBERCULOSIS IN MIGRANT POPULATIONS IN A METROPOLITAN DISTRICT COUNCIL IN THE NORTH OF ENGLAND

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Background: The majority of Mycobacterium tuberculosis (TB) cases in the UK (73%) occurred among people born in high-burden countries, and were concentrated in large urban centres[1]. However there is a lack of information about knowledge and attitudes towards TB in this population. As part of a TB Health Needs Assessment for Kirklees District, an industrial, urban district of West Yorkshire with a higher than average incidence of TB, a qualitative study was undertaken exploring awareness and attitudes towards the disease amongst migrant groups.

Methods: Community engagement workers ran 26 focus groups with different migrant groups across Kirklees using a standardised questionnaire. Purposeful sampling was used to get a cross-section of migrant communities. The transcripts were analysed using thematic analysis.

Results: All groups were aware of TB although knowledge was variable. Most groups did not see TB as an issue in their community and associated it either with the past or their country of birth. Most did not talk about TB, but did not see it

as a taboo subject or having a stigma in their community. Most would go to a doctor for advice.

Conclusions: This study reveals some of the misperceptions surrounding TB reported in other literature, but it also highlighted some interesting differences. TB was no longer commonly associated with stigma and general perception of risk of becoming infected with TB was low. This is important to take into account when developing and promoting TB services locally.

[1] Public Health England. Tuberculosis in the UK 2013 Report

P-47

OUTBREAK OF ACUTE RESPIRATORY INFECTION IN A CARE HOME FOR VULNERABLE ELDERLY: INVESTIGATION, MANAGEMENT AND CHALLENGES

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Background: An outbreak of acute respiratory illness affecting 35 people at a care home in the West Midlands, UK occurred from 27 February to 27 April 2012 and was investigated by the local Health Protection Unit.

Methods: An Outbreak Control Team was established to oversee investigation and management of the incident. Epidemiological data were collected from clinical and nursing notes and microbiological samples were collected.

Findings: Twenty-five of the cases were residents, 9 of whom died, and 10 were

staff members. Seven swabs were negative for viruses, but 3 of 9 serology samples were positive for influenza A. The first 2 cases occurred in staff members, 7-10 days before the first case in a resident. A third of staff and over two thirds of residents had received influenza vaccination prior to the outbreak.

Conclusions: A number of practical issues were identified in managing the outbreak, including late reporting of the outbreak, the difficulties of microbiological testing, the availability of staff records and the need to liaise with and between multiple clinicians on diagnosis and management.

P-48

OUTBREAK OF AVIAN INFLUENZA H9N2 IN A POULTRY FARM, EAST OF ENGLAND, 2013

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Background: In April 2013, an outbreak of avian influenza on a poultry farm in Suffolk was reported to Anglia Health Protection Team. Following PCR identification of an avian influenza virus, control measures were introduced using the precautionary approach.

Methods: An Incident Management Team was set up to conduct a risk assessment and implement appropriate control measures. Farm contacts were identified and asked for exposure information using a structured questionnaire, prescribed prophylactic oseltamivir, advised on personal protective equipment and to seek health advice for any illness.

Results: Early samples were negative

for highly pathogenic H5/H7, but further testing identified influenza A:H9N2.

13 out of the 20 exposed individuals were prescribed prophylactic oseltamivir based on the last day of exposure being less than seven days. Health monitoring for all those exposed was continued for seven days after last contact with infected birds. All remained asymptomatic, apart from one person who had a history of mild flu like symptoms and tested positive for parainfluenza virus.

Discussion: H9N2 viruses are of concern for their potential to cause human disease, and are considered one of the candidates for the next pandemic strain; hence the strict approach was applied to the management of this outbreak.

The incident occurred shortly after the implementation of the 2013 public health reforms and was a good test of the multiagency response and new public health arrangements. Although the overall response was reliable and efficient, it identified gaps in operational response capability and effective early interaction between the newly structured organisations.

P-49

EPIDEMIOLOGY OF MEASLES OUTBREAKS IN ENGLAND, DECEMBER 2012 - SEPTEMBER 2013

*Suzanne Coles, Adrian Wensley, Louise Coole
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Measles cases in England have been increasing in the last two years with an annual total of 1,920 confirmed cases in 2012, the highest annual figure since 1994. The increase continued into 2013

with 587 cases recorded in the first quarter of the year. Cases were spread across England, with the highest numbers in the North West and North East. Large outbreaks had been predicted to affect secondary schools based on the potential high susceptibility in these groups.

This poster describes the national epidemiology of outbreaks across England during the period of December 2012 to August 2013. The location, setting, age profile and attack rates in schools are described.

Results of the national review confirmed that the North East and North West experienced a high burden with sustained community transmission. Further analysis indicates that in general attack rates within schools were low and sustained transmission was seen in only few outbreaks. The number of confirmed cases associated with each outbreak was less than 10 in the majority of outbreaks and the average number of generations for discrete outbreaks was 2.

In conclusion the results of this national review of the pattern of measles outbreaks demonstrate that despite the period of increased incidence sustained transmission within closed setting, such as schools, was not a common event. This would suggest that the levels of herd immunity within school aged children may be higher than anticipated.

P-50

EVALUATION OF SPECIFIC MMR VACCINATION INTERVENTIONS DURING THE MMR CAMPAIGN IN 2013

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Public Health England was tasked by the MMR Catch-up Oversight Group to evaluate the national MMR catch-up campaign. An evaluation plan was developed which addressed different elements of this campaign.

This poster describes the effectiveness of delivering targeted vaccination interventions to support the uptake of MMR in England, during the period of increased incidence of measles and throughout the campaign period between April and September 2013.

In total, 10 discrete targeted vaccination interventions are included. This evaluation used a mixed methods approach involving data collection from existing reporting systems and semi-qualitative steps. The report collated data on the indication, setting and target group for the intervention. Intervention effectiveness was calculated where possible.

Results showed that there was a high level of knowledge on the communities and geographical areas where unvaccinated individuals resided. Information technology systems such as the Child Health Information system [CHIS] were not able to deliver a sufficiently accurate and detailed estimation of the number of unvaccinated children. In six of the interventions described in this report, the effectiveness of the intervention could be determined. Effectiveness ranged between 9.5% and 88% depending on the intervention.

The evaluation describes the following findings; uptake of MMR vaccination through targeted interventions was reported to be low in some of examples; the effectiveness of the vaccination intervention should be seen within the context of the target group; the delivery of local interventions was seen as a good method to establish partnership working within new organisational structures.

P-51

SURVEY OF PERTUSSIS AND INFLUENZA VACCINE UPTAKE IN PREGNANT WOMEN

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In 2011/12 the UK experienced a national outbreak of pertussis with the largest increase in cases seen for over two decades. During this outbreak the high morbidity and mortality in infants aged less than 3 months prompted the Department of Health (DH) to introduce a temporary vaccination programme for pregnant women with the aim of preventing infections in very young infants.

This cross-sectional survey of women delivering in maternity units in England over a five-day period during April and May 2013 aimed to provide an estimate of pertussis and influenza vaccine uptake in pregnant women and to describe variations according to age, ethnicity, parity and location.

1325 surveys were returned. Pertussis vaccine uptake was 52.6% (range 18.7% to 73% between former regions). Influenza vaccine uptake was 52.2% (range 29.0% to 70.1%)

Uptake of both vaccines was significantly higher in the White British ethnic group than in any other at 60% (95% CI 56% - 62%). Women in all other ethnicity categories were less likely to have had the vaccine; an effect which remained statistically significant for Asian and Chinese ethnicity following adjustment for age, parity, location and deprivation in a multi-variable model. Women with higher parity were also statistically less likely to have been vaccinated in the antenatal period. 98% of women receiving pertussis vaccine in pregnancy received the vaccine within the recommended 28 - 38 weeks gestation timeframe[i].

The results of this survey may be helpful for service planning and contribute to understanding of the programme effectiveness.

P-52

RABIES - A GLOBAL CHALLENGE

Gail Evans

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Rabies continues to present a challenge to public health and is responsible for approximately 55,000 deaths globally every year, the majority occur in Asia and Africa. There is still no known cure for Rabies and the mortality rate remains 100%. The UK has been rabies free since 1902 however deaths do still occur in UK citizens, the latest being returning traveller from Pakistan 2012.

The paper aims to consider the burden of disease in the UK, the current UK policy for giving pre and post exposure rabies prophylaxis, risks to the international traveller and rabies treatment options. The study sought to identify through available evidence if there is a need for a more pro-

active approach to managing the risk of rabies including the public health actions that can be undertaken that would have a significant impact on the number of exposures and rabies cases seen within the UK population.

The UK needs to consider its approach to protecting the population from rabies. A more pro active approach to raise awareness amongst international travellers as to the risk of rabies needs to be established. The UK would also benefit from establishing a surveillance system for pre exposure rabies vaccine as currently there is no reliable data on how many vaccines are given or for what reason. Measures need to be considered to ensure vaccines are affordable to all who require pre exposure protection as this could potentially reduce the cost to the NHS and protect the health of the population.

P-53

TIMELINESS AND FOLLOW-UP OF NEONATAL HEPATITIS B IMMUNISATION IN WALES: 2011-2012

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Hepatitis B virus is highly transmissible during the perinatal period for babies born to hepatitis B positive mothers. Timely prophylactic administration of hepatitis B vaccine and hepatitis B immunoglobulin (HBIG), where required, is more than 90% effective in preventing chronic infection in these babies, who would otherwise be at high risk.

To assist Public Health Wales Health Protection Team in ensuring timely follow up of newborns at risk of perinatal transmis-

sion, an all Wales Neonatal Hepatitis B Database was developed. This study summarises uptake and timeliness of neonatal hepatitis B vaccination for children born and resident in Wales during 2011 and 2012.

Fifty babies were born to hepatitis B positive mothers in 2012 and 71 were born in 2011. Twenty babies were lost to follow up (relocated). Median maternal age was 30 years. HBIG was indicated for 23/101 of the neonates and was delivered to 100% of these babies on their day of birth or the next day. All babies received their first and second dose of hepatitis B vaccination and 99% of babies received their third dose. All babies received dose one on their day of birth or the next day, 58% (59/101) of babies received dose two in a timely way and 59% (59/100) babies received dose three in a timely way (25-36 day intervals).

This study provides useful information to facilitate timeliness and follow up of neonatal hepatitis B immunisation and provides baseline epidemiological data for monitoring long term trends.

P-54

DEVELOPING PUBLIC HEALTH ENGLAND GUIDANCE FOR AN INTEGRATED APPROACH TO RESPONDING TO REPORTS OF DISEASE CLUSTERS

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Background: It is not uncommon for people to notice what they believe to be an abnormal number of cases of disease in people they know - be it patients, family, friends or their community. These apparent disease clusters - defined as 'unusual aggregation, real or perceived, of health events that are grouped together in time and space' are understandably concerning and can lead to questions about what may have caused them, with environmental contamination often alleged. Investigating disease clusters is multi-disciplinary involving medicine, statistics, epidemiology, public health and environmental science. With the advent of Public Health England (PHE), many experts from cancer registries, public health observatories and health protection have been brought together, providing an opportunity to develop guidelines for a systematic, integrated response to such incidents. Recent investigations by PHE staff have included birth defects attributed to a nearby landfill, and cancers thought to be associated with a village's mobile phone mast.

Methods and results: A multi-disciplinary group has reviewed the literature on cluster investigation. Many protocols describe parallel streams of investigation for health, environmental exposure and public communication. These findings are being used to develop PHE guidance that will set out a stepwise process for investigation, and multi-agency roles and responsibilities. The guidance will be published on the PHE website.

Conclusions: An agreed guideline will facilitate a coordinated response to complicated and sensitive cluster investigations, providing a transparent process that demonstrates how the result of the investigation was reached.

P-55**SHINGLES: A SWABBING SCHEME AS A SUPPORT OF THE NEW SURVEILLANCE SYSTEM IN PRIMARY CARE**

*Edna Kara, Iain Kennedy, Kevin Brown, Nick Andrews, Sonia Ribeiro, Gayatri Amirthalingam
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Shingles is characterised by a painful and unilateral rash resulting from the reactivation of the varicella zoster virus whose primary infection has usually occurred in the childhood.

Shingles risk and severity increase with age. In the UK around 50,000 individuals over 70 years of age are affected every year.

In September 2013 a shingles vaccination programme was introduced into the UK and targeted at adults aged 70 years with a catch up programme for those aged 79 years.

In order to monitor the implementation and evaluate the impact and effectiveness of the vaccination programme an enhanced surveillance is being set up by Public Health England through different systems. In addition, participating practices from the Royal College of General Practitioners and Primary Care Research Network are swabbing lesions and oral fluid from cases to support the evaluation of the diagnosis specificity and assess the viability of using oral fluid for diagnosis. Along with the swabs, data have been collected on demographics, vaccination history, previous shingles episodes, and immunosuppression.

By the end of February 2014, 143 practices were taking part in the swabbing scheme covering a population of

160,000 individuals aged 70 year and older.

A total of 84 samples, all from unvaccinated cases, have been tested. Around 67% were females. Seventy percent of the lesions were in the trunk. Five patients had history of immunosuppression.

This shingles surveillance scheme offer an invaluable opportunity to document post vaccine changes in the disease incidence and severity among a growing ageing population.

P-56**PROVISION OF A DRIED BLOOD SPOT SERVICE (DBS) TO INCREASE 12 MONTH TESTING OF INFANTS AT RISK OF HEPATITIS B INFECTION**

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Since 2000 the UK has offered universal antenatal screening for hepatitis B to all pregnant women. Infants born to hepatitis B surface antigen (HBsAg) positive mothers are at highest individual risk of acquiring infection. National guidance recommends that these infants receive a course of post exposure vaccination against hepatitis B at 0, 1, 2 and 12 months of age with the final dose given alongside a 12 month test to determine the infant's infection status. However, only 49.3% of infants born to HBsAg positive mothers from 2004-2011 were tested, despite the fact that even with complete and timely immunisation 5% of these infants become chronically infected

and are unrecognised unless tested.

Difficulty in obtaining venous blood samples in primary care has been reported as a contributory factor to the low uptake of testing. Therefore, in 2011, Public Health England (PHE) - Colindale piloted dried blood spot (DBS) testing, requiring only a heel prick to generate drops of blood, as a means of improving testing uptake. The pilot ran across 8 centres in England. DBS kits and testing were provided free of charge.

An evaluation of the pilot highlighted the demand and utility for DBS, the need for DBS training materials and the importance of local coordinated pathways to ensure efficient delivery. The program was launched nationally in September 2013. To date over 500 infants have been tested with new centres joining frequently. Challenges remain in integrating the service into existing models of provision, particularly in light of new NHS/PHE structures.

P-57

SURVEILLANCE OF POST HERPETIC NEURALGIA (PHN) ACROSS ENGLAND; A NOVEL SURVEILLANCE PROGRAMME

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In September 2013 a vaccination campaign was introduced in the UK for the routine immunisation of 70 year olds against Herpes Zoster (HZ) with a phased catch-up campaign for 72-79 year olds starting with those aged 79.

HZ is a clinical disease characterised by a unilateral vesicular rash, and is caused

by the reactivation of latent varicella zoster (VZ) virus. A severe complication of HZ infection is Post Herpetic Neuralgia (PHN)

The lifetime risk of HZ is 23-30% and the risk increase 5-10 fold over the age of 60. It is estimated that between 7-25% of HZ infections will lead to PHN with approximately 14,000 cases of PHN seen annually.

To monitor the impact and effectiveness of this vaccination campaign on the incidence of PHN a surveillance program has been setup in partnership with pain clinics across England.

Of 122 pain clinics contacted 88 (72%) have so far agreed to take part. It consists of a quarterly return form notifying any PHN cases seen, followed by completion of an enhanced questionnaire where a case is indicated.

First quarter returns are being received for the period following vaccine introduction. Regression modelling will be used to assess the impact of the vaccination program; the severity of PHN episodes will also be monitored.

This is believed to be the first surveillance system of its kind in England and it is hoped that its success will lead to the adoption of similar programs for other debilitating conditions in the future.

P-58**THE LOCAL AUTHORITY ASSURANCE ROLE FOR SEASONAL INFLUENZA VACCINATION IN WARWICKSHIRE**

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Aim: Undertake a programme of assurance and promotion of seasonal flu vaccination to maximise uptake in Warwickshire.

Background: With the transfer of Public Health to Local Authorities in April 2013, the responsibility for assurance of effective immunisation programmes locally sits with the LA Director of Public Health (DPH)

Seasonal influenza vaccination is offered to eligible people - those at increased risk of complications or those who are more likely to transmit influenza. In Warwickshire, 1 in 3 people were entitled to NHS influenza vaccination in 2013/14.

Methods: Warwickshire County Council (WCC) planned a programme which included:

- Working with Local Area Teams to set trajectories for providers.
- Advocating the commissioning of local pharmacies to provide vaccinations based on evidence and evaluation of a pilot scheme
- Delivering a promotional campaign through Local Authority Partners
- Delivering an evaluation to influence future delivery of Local Authority

vaccination assurance

Results: Uptake at the end of December is above national uptake for all risk groups and above national uptake in all risk groups in South Warwickshire and in Coventry and Rugby.

As uptake was lower in North Warwickshire, additional promotion was planned to direct people to the pharmacy service

Targeting messages at areas of previous low uptake has been successful.

Conclusions: The assurance role is new to Local Authorities but provides an essential element of maximising uptake locally.

P-59**INTRODUCTION OF A NATIONAL ROTAVIRUS VACCINATION PROGRAMME - MONITORING THE IMPACT ON THE BURDEN OF PAEDIATRIC DISEASE IN SCOTLAND**

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Health Protection Scotland, Glasgow, UK*

Rotavirus is a highly infectious virus and a common cause of sickness and diarrhoea worldwide. In the UK, most children will have had at least one rotavirus infection by the age of 5 years and a significant number of young infants will be hospitalised due to dehydration.

From July, 2013, a national rotavirus immunisation was introduced in the UK against the commonest strains of rotavirus. The vaccine Rotarix®, is given as an oral live attenuated vaccine at 2 and 3 months of age and now is included in the routine childhood immunisation

schedule.

Efforts are now focused on monitoring the impact of the vaccine on the burden of disease. Surveillance systems have been established by Health Protection Scotland (HPS) to supplement monitoring of laboratory confirmed cases. Clinical trials showed the efficacy of the vaccine is greatest on severe rotavirus infection, therefore monitoring of hospitalisations for all cause and rotavirus-specific gastroenteritis has been established. The impact on cases of rotavirus managed in the community is also likely to be substantial. Gastroenteritis in the community is now being monitored by extraction of consultation data from all GP practices and by trends in calls to NHS 24 for diarrhoea and/or vomiting. This will also give an indication of whether the vaccine programme has any indirect protection by reducing the incidence of rotavirus infection in older children.

The epidemiology of rotavirus in Scotland prior to the introduction of the vaccine; details of the surveillance being undertaken and preliminary findings will be presented.

P-60

INTRODUCTION OF A NATIONAL HERPES ZOSTER (SHINGLES) VACCINATION PROGRAMME - MONITORING THE IMPACT ON NEUROPATHIC PAIN

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In September 2013 the first national herpes zoster (Shingles) Immunisation campaign was launched using Zos-

tavax® vaccine. In Scotland, the vaccine is available from general practice (GP) surgeries to non-immunocompromised adults aged 70 years with a catch-up programme offered to 79 year olds.

Herpes zoster or shingles is characterised by a painful vesicular skin rash. Patients have reported pain ranging from moderate to severe and debilitating effects on mood, mobility, sleep and overall quality of life. Incidence of shingles increases with increasing age.

The main complication of shingles is post-herpetic neuralgia (PHN), a long-lasting neuropathic pain after rash has resolved. In Scotland, approximately 7,000 people aged 70 years and above develop shingles each year. Of these, between 700 -1,400 develop PHN.

People suffering from herpes zoster will usually consult their GP. Surveillance systems have been established by Health Protection Scotland and an aggregated data set is available from all the GP practices in Scotland. This has been supplemented by surveillance of hospital admissions for severe herpes zoster disease and related complications.

With the introduction of this vaccine comes a unique epidemiological opportunity to monitor the impact on occurrence of zoster related neuropathic pain. Epidemiology of herpes zoster in Scotland prior to the vaccine introduction; details of surveillance being undertaken and preliminary findings will be presented.

P-61**NATIONAL ROLLOUT OF PERTUSSIS ORAL FLUID TESTING IN CHILDREN IN ENGLAND AND WALES: 2013**

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In 2013 oral fluid (OF) testing was introduced in England and Wales for suspected pertussis cases aged 5 to 16 years with onset of cough ≥ 2 weeks. Prior to this, tests offered were culture by hospital laboratories and confirmation by the Respiratory and Vaccine Preventable Bacteria Reference Unit (RVPBRU), polymerase chain reaction (PCR - for hospitalised infants <1 year) and serology testing by RVPBRU.

Data from samples received between 01/01/2013 and 31/12/2013 were analysed. An OF titre of >70 arbitrary units (aU) of anti-pertussis toxin IgG was taken as consistent with recent infection. As with cases confirmed by other methods, OF cases were followed up for onset and vaccination history.

A total of 213 samples were received and 98% (n=208) were tested. Of these 49% (101/208) tested positive for a recent infection. No positive cases had been vaccinated within the previous year.

Of those who reported onset date (85%; 182/213), 88% (160/182) were symptomatic for 2 weeks or more. Eighty-nine of 101 (88%) positive cases had a reported onset date and 7 were less than 2 weeks before the OF sample was taken. Nine of the OF positive cases also tested positive by serology.

In 2013 there were 712 laboratory confirmed cases of pertussis in England and

Wales in children aged 5 to 16 years; 13% (n=92) tested positive by OF only compared to 85% (n=602) by serology.

OF testing increased ascertainment by 15% in children and teenagers and is an acceptable and practical tool for ascertaining pertussis infection.

P-62**IMPROVING FRONTLINE HCWS FLU VACCINATION UPTAKE IN DERBY CITY**

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Aim: To improve front-line Health Care Workers (HCWs) flu vaccination uptake in Derby City.

Background: In 2010/2011, only 26% of frontline staffs were vaccinated in Derby City compared to England 34.7%. HCWs flu vaccination reduces the risk of transmitting flu virus to vulnerable patients and reduces mortality. Therefore, DH had set ambitious target of 60% in 2011/12 and 70% uptake by 2012/13.

Challenges: Limited access to vaccination

Concerns around vaccine safety

Lack of awareness

Difficulties in obtaining practice data

Method: Cohort Identification- PH team worked closely with HR and Practice Managers to develop clear list of front line staff and clarify denominator.

Leadership- PH leads, clinical lead-

ers and Practice Managers acted as role models to encourage staff take up of flu vaccination.

Access- Worked closely with practices and occupational health to make vaccine easily available and accessible to front-line staff.

Communication- provided information on importance of staff flu vaccination and accessing flu clinics using variety of channels like intranet, internal emails, texts, payslip, staff bulletins and team meetings.

Campaigns- PH led a partnership wide campaign across all trusts in Derby City to promote flu vaccination amongst front-line HCWs. Information and presentations were given to staff.

Data collection- Data quality and performance management were improved through monthly data collection from GP practices and feedback to GPs and Practice managers to share best practice.

Conclusion: Significant improvement in HCWs uptake for Derby in 2011/12 and 2012/13 i.e. 70% and 76.6% respectively which was highest in East Midlands region and above national average

P-63

SUCCESSFUL IMPROVEMENTS IN THE CHILDHOOD IMMUNISATIONS IN DERBY CITY

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Aim: To develop a robust strategic immunisation plan and forward surveillance system to turn around failing childhood immunisations targets in Derby city.

Background: Immunisation is one of the most fundamental elements of Public Health. As a city we were failing to meet the 95% World Health Organisation target for a range of childhood vaccinations. If less than 90% of a community are immunised then there is a real risk of spread of infection and outbreaks.

Challenges: Challenges were new immigrant population, high deprivation, wide inequalities and mixed ethnicity, often mobile families, lack of education and awareness, language barriers, parental attitudes and repeatedly missing appointments, severe financial pressures limiting investment in coordination and promotional activities, technical and practical issues.

Method: To address these challenges and improve national immunisation targets; innovative strategic immunisation plan was developed by public health lead in Sept/October 2010 and implemented across all GP practices in Derby city.

Five Key Strands

1. Strategic planning, effective leadership, networking
2. Forward reporting- proactive rather than reactive approach
3. Data collection and improving data quality
4. Performance feedback to GPs and training
5. Health promotion and engagement

The work included mainly doing simple things well, developing strong relationships, working proactively with right information with right people at the right time.

Conclusion: This focussed multi-faceted approach has led to significant improve-

ments quarter-on-quarter on all our childhood immunisation indicators i.e. 7-10% over period of two and half years. Four out of six indicators improved from 85% to 95% and successfully achieved national targets.

P-64

IMPROVING SEASONAL FLU VACCINATION AMONG PREGNANT WOMEN IN DERBY CITY

Sudhakar Shinde

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Aim: To improve pregnant women flu vaccination uptake in Derby City

Background: Pregnant women are at very high risk of hospitalisation if they catch the H1N1 virus infection. Although midwives do not routinely give vaccinations, they are well engaged to vaccinate their patients, but in an acute trust they have number of barriers to implement effective midwife lead flu service.

Challenges:

1. Midwife and /or patient concerns around vaccine safety
2. Lack of awareness of risks amongst midwives
3. Practice difficulties in identifying population
4. Inaccurate practice recording and reporting of denominator
5. Limited accessibility to clinics for individuals

Method:

1. Provided education and training to midwives as required to promote flu vaccination

2. Midwifery leads assured that all midwives are trained and competent to promote flu vaccination
3. Midwifery leads provided assurance of vaccination documentation within maternity records, and data shared with public health
4. Public health facilitated collaboration between practices and midwifery teams
5. Monthly flu data collection from practices and midwives
6. Promote vaccination and raise awareness through communications strategies
7. Public health provided resources like leaflets and posters, distributed to antenatal clinics, GP practices etc.
8. Practices ensured accurate records of target population
9. Advice practices to maintain a manual list in conjunction with midwives

Results: Almost all pregnant women attending antenatal clinic received information about influenza vaccination and sign-posted to GPs for flu vaccination. With this approach, in 2012/13 Derby City has achieved a 50.3% uptake for pregnant women flu vaccination which is highest in the region (41.9%) and national average (40%).

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MEASLES OUTBREAK MANAGEMENT IN DERBY CITY

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Background: The HPA has investigated several outbreaks of measles in Gypsy and Traveller Communities across the UK. In the East Midlands there was 1 confirmed and 6 probable cases in Traveller communities during August 2012. Health Protection Unit had reminded all Health Professionals about the Measles outbreak and it had to be notified to the local HPU within 72 hours.

Measles Outbreak in Derby City at Traveller Site: The measles outbreak in Derby City at Traveller site had approximately 40 children with incomplete immunisations. Outbreak Control Team (OCT) measures was followed to offer MMR and HNIG at Traveller's site on 14/08/12. 13 children aged between 6½ months to 10 years received a first MMR vaccination and 2 babies under 6½ months were given immunoglobulin at Children's A&E at Royal Derby Hospital. The administration of vaccines was communicated to GP Practices, CHIS and Immunisation Lead.

Among those, 4 children were confirmed with salivary test kits and serology. They were old enough to have MMR vaccination but were unvaccinated. The Derby gypsy liaison group alerted other traveller sites in Derbyshire to the measles risk. Salivary test kits were also left at Derby Hospital in Children's A&E.

Issues Identified and Lessons Learnt

1. Reluctance – Motivation and explained importance
2. Illiteracy – Raised awareness

3. Offering immunisations on site – Time consuming but effective
4. CED initiative for Immunisation

Actions and Recommendations

1. Multi-agency working
2. CCG & NHSE involvement
3. Inequality Direct Service: (Home Visiting Service)
4. CED Immunisation Catch-Up Service

Implications

1. Cost-effectiveness
2. Protecting local population
3. Environmental sustainability

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SEROTYPE-SPECIFIC TRENDS IN THE INCIDENCE OF INVASIVE PNEUMOCOCCAL DISEASE (IPD) FOLLOWING PNEUMOCOCCAL CONJUGATE VACCINE INTRODUCTION IN NORTH-EAST ENGLAND

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Background and Aims: The 7-valent pneumococcal conjugate vaccine (PCV7) was included in the routine UK childhood immunisation programme from September 2006 and was replaced by the 13-valent vaccine (PCV13) in March 2010. This paper describes the serotype-



specific incidence trends of IPD cases in north-east England post-PCV7/13 introduction.

Methods: An enhanced surveillance system in north-east England collected data on each IPD case reported to the North East Health Protection Unit by local microbiology laboratories. Cases included in this study had a specimen date between 1st April 2006 and 31st March 2013.

Results: Between 2006-07 and 2012-13 the incidence of IPD decreased for PCV7 serotypes (3.6 cases/100,000 population vs 0.2; incidence rate ratio (IRR) 0.04, 95% CI 0.01-0.11, $p < 0.0001$) and PCV13 serotypes (7.2 cases/100,000 population vs 3.2; IRR 0.44, 95% CI 0.33-0.57, $p < 0.0001$). Non-PCV13 incidence increased from 2.8 to 4.0 (IRR 1.45, 95% CI 1.06-1.99; $p = 0.0149$). Incidence caused by the six additional serotypes in PCV13 decreased from 4.6 to 3.0 between 2010-11 and 2012-13 (IRR 0.63, 95% CI 0.47-0.85; $p = 0.0014$). We will also report trends by age group, for individual serotypes and for PPV23 serotypes.

Conclusions: Since the introduction of the conjugate vaccines, PCV7 and PCV13 serotype incidence rates have decreased significantly, whilst non-PCV7/13 incidence rates have increased due to vaccine pressure. The incidence of IPD caused by the six additional serotypes in PCV13 decreased significantly following introduction of the vaccine in 2010. Monitoring the distribution of specific vaccine serotypes of pneumococcal disease is important to evaluate current and future vaccination policy.

SPEAKERS AND CHAIRS

Natalie Adams

Natalie Adams joined Public Health England as an epidemiologist in 2012 after completing a degree in Geography and a Masters in Public Health at the University of Nottingham. Natalie is currently based at the Gastrointestinal, Emerging and Zoonotic Infections department working on gastrointestinal infections, primarily norovirus.

Gillian Armstrong

Gillian is an ST2 in public health in Northern Ireland and currently works for the Public Health Agency. Gillian was a foundation doctor and a paediatric registrar prior to her career in public health. Gillian has a particular interest in blood borne viruses.

Naima Bradley

Naima Bradley works as the Head of Environmental Hazards and Emergency Department in the Centre for Radiation, Chemical and Environmental Hazards (PHE). She has over 25 years' experience in the chemical hazards and environmental fields and is a Chartered Chemist and Chartered Scientist. She worked in industry at national and European levels and in Environmental Health (London and Birmingham) before joining the health protection community in 2002.

Subhashis Basu

Dr.Subhashis Basu (Bazz) is an NIHR Specialist Registrar in Occupational Medicine with a background in public health. He is based at Sheffield Teaching Hospitals and at the Health and Safety Laboratory, Buxton, England. His research interests are varied and include physical activity at work, handling of green waste, environmental health and medical education.

Jane Bethea

Jane is a Lecturer in Public Health & Epidemiology at the University of Leicester and a Specialty Registrar in Public Health. In addition to Meningitis W135, her academic interests include medical education, smoking and risk perception. In public health practice Jane is particularly interested in disability issues and mental health.

Renu Bindra

Renu Bindra is a CCDC in the Yorkshire and Humber health protection team in Public Health England. Her main areas of work are TB, influenza and emergency planning. Having initially worked as a generalist public health consultant in PCTs prior to the 2013 upheaval, this is her first attendance at a 5 Nations Health Protection Conference.

Angie Bone

Dr Angie Bone is head of the Extreme Events and Health Protection team at PHE. A medic by background, she has a broad experience including UK public health training, European Programme in Interventional Epidemiology training (EPIET), and appointments with the International Committee of the Red Cross, and the WHO.

Sarah Collins

Biography not available.

Louise Coole

Louise Coole is a Consultant Epidemiologist with the Field Epidemiology Service (PHE). Her key interests are vaccine preventable infections, children's health and the application of epidemiological methods to outbreaks and public health questions. Previously Louise was a CCDC for ten years and in a past life trained as a microbiologist.

John Cowden

John entered public health in 1981. He became a senior registrar PHLS Communicable Disease Surveillance Centre in 1985. In 1989 he was appointed the first consultant at CDSC responsible for the new Gastrointestinal Diseases Section. He moved to a similar lead job at the national centre in Scotland in 1995, and, retired in 2013.

Henriette de Valk

Henriette de Valk is a medical epidemiologist and the head of the Foodborne, Vectorborne and Zoonotic Infections Unit at the French National Institute for Public Health Surveillance. She investigated several outbreaks of arbovirus infections, in mainland France as well as in the overseas territories and worked on preparedness and response plans for arbovirus infections in France and Europe.

Meirion Evans

Meirion Evans is a Consultant Epidemiologist at the Communicable Disease Surveillance Centre, Public Health Wales and Reader at the Cochrane Institute of Primary Care and Public Health, Cardiff University. He worked as a CCDC for 10 years before taking up his present post.

Kirsty Foster

Kirsty has worked as a Consultant in Health Protection since 2005, after working in general public health, and prior to that general medicine.

Her day to day work includes the surveillance and investigation of communicable diseases, management of outbreaks and incidents relating to communicable diseases and non-communicable / environmental hazards.

Camilla Ghiasee

Camilla Ghiasee is an Environmental Public Health Scientist at the PHE Centre for Radiation and Chemicals Environmental Hazards (CRCE). Here she focusses on public health risk assessments for acute and chronic environmental hazards; providing advice to a variety of stakeholders.

Leena Inamdar

Leena is Consultant in Health Protection at Public Health England, in Leeds. Leena's areas of interests include TB, epidemiology and surveillance of infectious diseases and immunisation. She has worked as lead for sexual health and gastrointestinal infections Yorkshire and Humber and is a Fellow of Faculty of Public Health, UK.

Neil Irvine

Neil Irvine is a Consultant in Health Protection with the Public Health Agency in Belfast. He has lead responsibility for the health protection aspects of HIV and sexually transmitted infections.

Christopher Johnson

Dr Christopher Johnson is a Specialty Registrar on the public health training scheme based in North Wales. His background is in Environmental Chemistry, and before joining the scheme he worked on chemical incident management and in particular land contamination at the HPA Centre for Radiation, Chemical and Environmental Hazards.

Shamez Ladhani

Dr Shamez Ladhani completed his medical training with honours in pathology at the United Medical and Dental Schools of Guy's and St. Thomas' Hospitals, London, UK, in 1997. Following his internship, he worked as a paediatric registrar in Kilifi, Kenya, and in 2000, returned to London to start his specialty training in paediatrics. During 2004–2007, he completed his 3-year PhD

in genetic epidemiology of conjugate vaccine failure at Queen Mary University of London, and in 2007, was selected for one of the two annual 2-year national training programmes in paediatric infectious diseases, which he completed at St. George's Hospital, South London. Dr Ladhani qualified as a paediatric infectious disease consultant in 2009. He currently works as a clinical epidemiologist in the Immunisation Department at Public Health England, honorary paediatric infectious diseases consultant at St. George's Hospital and honorary senior lecturer at St. George's University of London. He is the clinical lead for a number of national surveillance programmes including *Haemophilus influenzae*, *Streptococcus pneumoniae*, *Neisseria meningitidis* and rotavirus. He also regularly co-ordinates childhood vaccine trials on behalf of the Department of Health to inform national policy. He has over 80 mainly first-author publications in peer-reviewed journals and has co-authored several book chapters.

Charlotte Landeg-Cox

Charlotte Landeg-Cox works as an Environmental Public Health Scientist at Public Health England's Centre for Radiation, Chemical and Environmental Hazards. Charlotte has experience in many areas of environmental public health including, chemical incident management, water quality, maritime incidents and environmental permitting. Charlotte holds an honours degree in Environmental Health and prior to her role with PHE Charlotte worked as an Environmental Health Officer in local authority specialising in the area of pollution.

Jon Lawler

Jon Lawler is a senior health protection nurse at the North East Public Health England Centre, based in Newcastle upon Tyne.

Lorraine Lighton

Lorraine Lighton has been a CCDC in Greater Manchester for over 20 years and is the Greater Manchester lead for gastrointestinal infections and zoonoses. In her spare time she chairs a Research Ethics Committee, is the UK Faculty of Public Health Director of CPD and sits on the bench at Manchester and Salford Magistrates Court.

Kelly Mackenzie

Dr Kelly Mackenzie is currently a second year Public Health Specialty Registrar in the East Midlands. She is also in the process of completing her Master's in Public Health at the University of Sheffield. Prior to this, she worked in respiratory medicine after successfully completing her Medical Degree in 2007.

John Mair-Jenkins

John Mair-Jenkins is a Specialty Registrar in Public Health based in the East Midlands, currently on placement with Public Health England East Midlands Centre.

Rosemary McCann

Rosemary Mc Cann is a Consultant in Communicable Disease Control with Public Health England Greater Manchester. Rosemary has a particular interest in immunisation programmes and training.

Dilys Morgan

Dilys Morgan has had a long and interesting career alternating between mainly medical research in rural Africa where she lived and worked for 13 years, and UK public health. Dilys is currently Head of Gastrointestinal, Emerging and Zoonotic Infections at Public Health England, Colindale London. Her particular interests are the detection and assessment of new and emerging infections,

particularly at the human-animal interface. She is also an honorary Professor at the London School of Hygiene and Tropical Medicine and has been organising the 5 nations Conference since 2002.

Gareth Morgan

Gareth has extensive experience in the field of substance misuse particularly with young people and the homeless. His role within Public Health Wales includes implementation and maintenance of the Harm Reduction Database Wales (HRD) in Pharmacy and Specialist Needle & Syringe Programmes, and Take-home Naloxone registries throughout Wales.

Catherine O'Connor

Catherine O'Connor is an epidemiologist in the Emerging Infections and Zoonoses section at Public Health England's Centre for Infectious Disease Surveillance and Control. With a background in microbiology, veterinary public health and veterinary epidemiology, Catherine is also a member of UK cross-agency Human Animal Infections and Risk Surveillance (HAIRS) group

Ebere Okereke

Ebere Okereke is a consultant in communicable disease control the Yorkshire and Humber in Public Health England Centre. She switched from general medicine to public health following a 'eureka moment' during a communicable disease control lecture at the Liverpool School of Tropical Medicine in 1994. Her special interests are in tuberculosis and zoonoses and she believes very strongly that everything worth knowing about public health can be learned from TB prevention management and control. She is currently Yorkshire & Humber TB lead and chairs the PHE TB centre leads group.

Simon Padfield

Simon Padfield has worked as a CCDC in the Yorkshire and Humber area since 2009 and now also works as part of the FES team two days a week based in Leeds.

Lynsey Patterson

Lynsey Patterson is a Senior Epidemiological Scientist at the Public Health Agency (Northern Ireland) with experience in healthcare associated infections and antimicrobial resistance. She is interested in epidemiological methods and statistics in the areas of pharmaco- and infectious disease epidemiology with a focus on the applicability and relevance of analysis.

Gillian Penrice

Dr Gillian Penrice graduated from Glasgow University in 1986. She spent a number of years as a GP in Glasgow before retraining in public health. She has been a consultant in public health medicine in the public health protection unit of NHS Greater Glasgow and Clyde since 2006.

Alison Potts

Dr Alison Potts is an epidemiologist with Health Protection Scotland, based in Glasgow. Alison's responsibilities include surveillance for Legionnaires' disease and support for health boards during outbreaks. HPS has led investigations into Legionella longbeachae incidents in Scotland over the last two years and Alison has played a principal role in these investigations.

Thomas Pottage

Tom Pottage has been working in the Biosafety department of PHE Porton Down for 10 years. At present he is working on the UK Recovery Handbook for Biological Incidents providing an evidence-based approach for dealing with biological contamination in a range of environments. The Handbook will be published in 2015.

Gill Richardson

Gill trained in General Practice before entering Public Health. She was 8 years Director of Public Health for Caerphilly County then for the integrated Aneurin Bevan University Health Board (Gwent, population 639,000) for last 4 years.

Publications include Poliomyelitis in North Africa, water - borne *Campylobacter*, Hepatitis B and cardiovascular risk assessment in deprived populations.

Mary Ramsay

As a consultant epidemiologist and Head of Department at HPA Colindale, Mary has been responsible for the national surveillance of vaccine preventable diseases since 1994. This includes taking the lead on the collation and analysis of enhanced surveillance information on a range of infections, and using this to inform national vaccination policy. Mary also provides expert advice to a range of UK agencies and to individual NHS professionals. Mary is joint chief editor for the UK's Immunisation Against Infectious Disease. Between 1999 and 2007 Mary was project coordinator for the European Union Surveillance of Invasive Bacterial Infection project. I also serve on the Meningitis Research Foundation's Medical Research Panel and have been a temporary advisor to the WHO on immunisation policy.

Iain Roddick

Iain Roddick is the Information Manager with the PHE Eastern Field Epidemiology Unit. He has an interest in developing smarter ways of working with surveillance data, mainly using database automation to perform complicated processes and analyses that would be too laborious to do manually.

Bengu Said

Bengü Said is a senior epidemiological scientist in the department of Gastrointestinal, Emerging and Zoonotic Infections at Public Health England, Colindale. She is responsible

for the national surveillance of hepatitis E and for research projects on emerging zoonoses, including the Bat workers study and the Serum Archive for Emerging Zoonoses.

Charles Saunders

Charles Saunders is a Consultant in Public Health Medicine (Communicable Disease & Environmental Health) at Fife NHS Board since 1995. Former GP. Member of Health Protection Network.

Sarah Smith

Sarah graduated with a BSc in Biomedical Science and completed the NHS Graduate Management Training programme before embarking on a career in public health. Currently a Public Health Specialist Registrar based in Yorkshire and Humber working at NHS England with previous placements at Wakefield PCT and Public Health England.

Rachel Spiers

Rachel Spiers joined the Public Health Agency after completing a degree in Tropical Disease Biology from the University of Liverpool and a Masters in Public Health from Queen's University, Belfast. Rachel is currently based in Belfast as an Epidemiological Scientist specialising in healthcare associated infection and antimicrobial resistance.

Alex Stewart

Alex Stewart is a Scot masquerading as a CCDC in Liverpool but having an interest in unusual aspects of health protection. Mike Bradley is a GP trainee who helped widen the scope of health protection in Liverpool during his short but eventful time there.

Rhianwen Stiff

Dr Rhianwen Stiff graduated from the University of Wales College of Medicine in 2001 and worked in acute hospital medicine and clinical genetics before joining the Wales Public Health Training Scheme as a Walport



Academic Fellow in 2007. She is currently undertaking a PhD investigating long-term health effects following acute infection with *Cryptosporidium*.

Suzan Trienekens

Suzan Trienekens (MSc) has worked in the Netherlands Institute of Public Health and the Environment (RIVM) and Public Health England's Centre for Infectious Disease Surveillance & Control as a scientist on HIV/STI epidemiology and is currently working for Field Epidemiology Services (PHE) in Victoria, mainly on outbreak investigation and gastrointestinal infections.

Adrian Wensley

Adrian Wensley is an epidemiological scientist with the Public Health England Field Epidemiology Service, based in Leeds. He has a Masters in Public Health and is currently working towards a PhD at the University of Lancaster. Adrian's areas of interest include vaccine preventable diseases and outbreak investigation.

Chris Whiteside

Chris is a CCDC in North Wales. She previously worked as an anaesthetist in the UK and developed an interest in communicable disease control having worked as a volunteer in South Sudan, Nigeria and Sri Lanka. Her current interests include zoonoses, and the environmental transmission of viruses.

Lauren B Wright

Lauren Wright is an invasive pneumococcal disease research assistant at the North East Public Health England Centre, conducting epidemiological research using enhanced surveillance data. A published author in a scientific journal, Lauren achieved a BSc in Mathematics and an MSc in Statistical Epidemiology prior to this position.



Notes

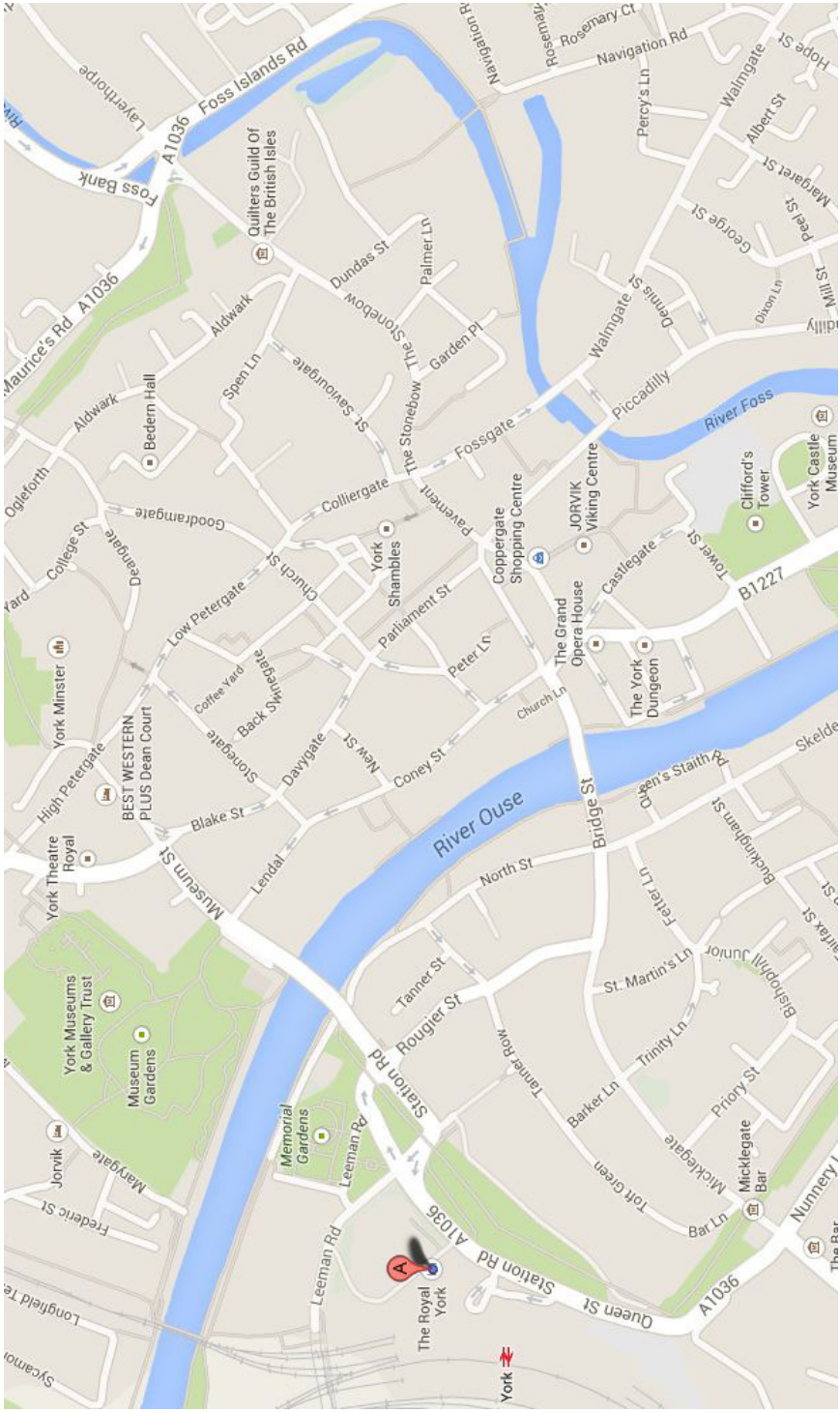


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York City Map



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