

5 Nations Health Protection Conference



Radisson Blu St. Helen's Hotel, Dublin, Ireland
14th & 15th May 2013

Final Programme & Abstracts

#5nations

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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 and Specialists in Public Health Medicine / Health Protection 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.

| TUESDAY 14 MAY 2013 | | |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 09.00 – 18.00 | Registration Open | |
| 10.00 – 10.15 | Welcome and Introduction Address by the Minister of State for Primary Care in the Department of Health | Alex White |
| 10.15 – 11.00 | Keynote Address Management of acute public threats | Michael Ryan |
| 11.00 – 12.30 | Outbreak! New Challenges, New Solutions <i>Organisers: Lorraine Lighton & Charles Saunders</i> <i>Chair: Charles Saunders</i> | |
| 11.00 – 11.15 | Verotoxin producing <i>Escherichia coli</i> O26 and haemolytic uraemic syndrome in two child care facilities; a community outbreak in rural Ireland, May 2012 | Una Fallon |
| 11.15 – 11.30 | An outbreak of <i>Listeria monocytogenes</i> due to consumption of pressed beef | Kenneth Lamden |
| 11.30 – 11.45 | An outbreak of listeriosis in South Yorkshire associated with the consumption of pork pies | Nachi Arunachalam & Corrine Amar |
| 11.45 – 12.00 | Flu vaccination in elderly care home residents – are we really learning the lessons from past outbreaks? | Leena Inamdar |
| 12.00 – 12.15 | Nosocomial transmission of TB in a UK hospital | Shaji Geevarghese |
| 12.15 – 12.30 | Birmingham or Bradford – TB strain typing cluster investigations are resource intensive | Leena Inamdar |
| 12.30 – 13.30 | Lunch / Posters | |
| 13.30 – 15.00 | Surveillance – Seeing the Wood for the Trees <i>Organisers: Meirion Evans & Chris Whiteside</i> <i>Chair: Meirion Evans</i> | |
| 13.30 – 13.45 | From research to delivery: real time health protection surveillance for the London 2012 Olympics & Paralympics | Martin Schweiger |
| 13.45 – 14.00 | Confirmed cases of measles in children under 1 year in North West England, 2007-2012 | Alex Keenan |
| 14.00 – 14.15 | Molecular epidemiology of <i>M. tuberculosis</i> in Scotland, 2000-2012 | Tara Shivaji |

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|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 14.15 – 14.30 | Epidemiology of <i>M. bovis</i> in humans and cattle, N Ireland, 2000-2012 | Cathriona Kearns |
| 14.30 – 14.45 | Enhanced surveillance of VTEC in England, 2009-2012 | Lisa Byrne |
| 14.45 – 15.00 | How many?! Norovirus surveillance: what we saw in the first three seasons | Natalie Adams |
| 15.00 – 15.30 | Tea / Coffee / Posters | |
| 15.30 – 16.00 | Attended Poster Session | |
| 16.00 – 17.00 | Bloodborne Viruses and Sexually Transmitted Infections – Home and Away <i>Organisers: Neil Irvine & Lelia Thornton</i> <i>Chair: Lelia Thornton</i> | |
| 16.00 – 16.15 | Developing a best practice guidance toolkit for tattooing and skin piercing practitioners and their premises through multi-agency collaboration | Ian Grey |
| 16.15 – 16.30 | Coinfection and risk factors for four prevalent STIs in Ireland | Frances Shiely |
| 16.30 – 16.45 | Home delivered dried blood spot testing - assessing the impact on screening uptake for household contacts of hepatitis B infected pregnant women | Philip Keel |
| 16.45 – 17.00 | An audit of the clinical pathway for patients diagnosed with hepatitis C in Mid Essex between Jan 2007 and Feb 2010 | Smita Kapadia |
| 17.00 – 18.00 | PHMEG Annual Meeting (The Belville Room) | |
| 18.30 – 19.45 | Drinks/Pre-Dinner Quiz <i>Organisers: Lorraine Lighton & Paul McKeown</i> <i>Quiz Master: Charles Saunders</i> | |
| 19.45 for 20.00 | Conference Dinner | |

| WEDNESDAY 15 MAY 2013 | | |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 08.00 – 13.00 | Registration Open | |
| 09.00 – 10.15 | Vaccine Preventable Diseases: Injecting some common sense into disease prevention <i>Organisers: Kirsty Foster & Joan O'Donnell</i> <i>Chair: Kirsty Foster</i> | |
| 09.00 – 09.15 | Outbreak of measles in a prison in North Yorkshire | James Crick |
| 09.15 – 09.30 | The dangers of delaying and defaulting childhood immunisations: the challenge of schedule change | Louise Cullen |
| 09.30 – 09.45 | Changing epidemiology of mumps in Northern Ireland | Catherine Coyle |
| 09.45 – 10.00 | Impact of written correspondence with General Practitioners on laboratory confirmed pertussis notifications in Northern Ireland | Jillian Johnston |
| 10.00 – 10.15 | First evidence of prevalence of Human Papillomavirus (HPV) infection in men who have sex with men (MSM) in Ireland: a stimulus for vaccine review | Corinna Sadler |
| 10.15 – 11.15 | Environmental Change and the Four Furies – Fire, Flood, Freeze andWee Beasties! <i>Organisers: Jackie Hyland & Paul McKeown</i> <i>Chair: Colin Ramsay</i> | |
| 10.15 – 10.45 | Fracking – What is it? | Anthony Breslin |
| 10.45 – 11.00 | Waterborne verotoxin producing <i>Escherichia coli</i> outbreaks in the Irish Midlands 2011 and 2012 | Ina Kelly |
| 11.00 – 11.15 | Extreme events and health protection: what are the challenges for public health? | Virginia Murray |
| 11.15 – 11.45 | Tea / Coffee / Posters | |

| | | |
|----------------------|--------------------------------------------------------------------------------------------------------------------------|---------------|
| 11.45 – 13.00 | Hot Topics <i>Organisers: Dilys Morgan & Gavin Dabrera</i> <i>Chair: Dilys Morgan</i> | |
| 11.45 – 12.00 | Widespread subclinical abnormal prion protein in a second UK survey of archived appendix specimens | Noel Gill |
| 12.00 – 12.15 | Human <i>Mycobacterium bovis</i> infection in an abattoir worker in the UK | Musarrat Afza |
| 12.15 – 12.30 | The challenges encountered in the public health response to an outbreak of novel coronavirus (nCoV) in the West Midlands | Ruth Harrell |
| 12.30 – 13.00 | Influenza H7N9 – is this the start of the pandemic we have been preparing for? | John Watson |
| 13.00 | 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 WiFi access free to delegates who have their own devices. Please see the registration notice board for password and log in details.

Posters

Posters will be displayed in Pembroke 3. Posters should be put up by 09.00 on Tuesday 14 May and must be removed by 13.00 on Wednesday 15 May. There will be a dedicated poster session on Tuesday 14 May at 15.30 – 16.00 where poster presenters will be given the opportunity to present their work to delegates.

Registration/Information Desk

All delegates will receive their name badge, conference documents and all relevant conference information upon arrival at the Radisson Blu.

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

| | |
|------------------|---------------|
| Tuesday 14 May | 09.00 – 18.00 |
| Wednesday 15 May | 08.00 – 13.00 |

Tea/Coffee Breaks and Lunch Arrangements

Tea and Coffee points will be located in the foyer outside the Pembroke 1, 2 & 3 and lunch will take place in Talavera Wine Bar.

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.

Presentation Abstracts

Tuesday 14 May 2013

Key Note Presentation

MANAGEMENT OF ACUTE PUBLIC HEALTH THREATS

WHERE ARE WE TEN YEARS ON FROM SARS AND FIVE YEARS ON FROM THE COMING INTO FORCE OF THE REVISED INTERNATIONAL HEALTH REGULATIONS (IHR)

Dr. Michael J Ryan

Adjunct Professor of International Health, University College Dublin

The emergence, amplification and global dissemination of SARS from November 2002 to June 2003 was a wakeup call to the world and exposed many weaknesses in national and international preparedness, surveillance, response, containment and communication. It also demonstrated the great courage and determination of medical, laboratory and public health professionals in identifying, tracking and containing the disease using centuries old methods aided by modern technologies. The epidemic ended with calls for more investment in public health infrastructure and cooperation between sectors at national and international levels.

These aspirations were partially achieved with the agreement on and coming into force of the IHR in 2005 and 2007 respectively. The revised IHR provided a legally binding global

framework for improving detection, reporting, and response to public health emergencies. Key to this objective was the enhancement of eight core national capacities covering legislation, financing, coordination, surveillance, response, preparedness, risk communication, human resources, and laboratory services

Ten years on from SARS and five years on from the revised IHR have we entered a new era of public health security? While all countries have signed up to the IHR it is clear that many have not reached the objectives established. In the most recent review carried out by WHO requesting countries assessment of whether they had achieved agreed minimum capability levels responses ranged from 44% for human resources to 75% for surveillance.

We are faced with ever more complex and convergent risks driven for the most part by our own behaviour and technologies. These risks require coherent responses that build national and international public health infrastructure, communications and cooperation in a fair and equitable manner. We have underestimated the true cost of doing this and clearly have not made an adequate case for that investment.

Tuesday 14 May 2013

SESSION 1

Outbreak! New Challenges, New Solutions

VEROTOXIN PRODUCING *ESCHERICHIA COLI* 026 AND HAEMOLYTIC URAEMIC SYNDROME IN TWO CHILD CARE FACILITIES; A COMMUNITY OUTBREAK IN RURAL IRELAND MAY 2012

Una Fallon¹, Ger Meagher¹, Ina Kelly², David Weakliam¹, Caitlin Ni'Shuileabhan¹, Phil Jennings¹

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Following a case of haemolytic uraemic syndrome (HUS) in a young child, several cases of verotoxin producing *E Coli* 026 were detected in a rural child care facility (CCF). Three weeks later, another case of HUS was diagnosed in a child attending a different nearby CCF, where further VTEC cases were detected. VTEC strains in the two facilities were indistinguishable.

We report on a cohort of 200 from whom a screening sample was requested. A Kaplan Meier survival curve of time to microbiological clearance will be presented. There were 31 confirmed cases, 20 probable cases, 4 cases of HUS and 6 hospitalisations. The attack rate was 45% (CCF A) and 32% (CCF B). The longest time to clearance was

109 days with a mean of 35 days (95% CI 27-44).

While the source was not determined, a significant increase in VTEC rates across Ireland was noted during this time, with an almost three-fold increase from 199 cases in 2010 to 562 in 2012. Many of these were associated with farming activities and private water supplies.

Local department learning will be discussed. Local actions resulting from this outbreak include the introduction of non-0157 VTEC testing and a review and inspection of hygiene policies and practices in all CCFs in the county. National actions include a review of the policy of screening asymptomatic contacts, consideration of the evidence of treating prolonged shedders, renewed emphasis on well maintenance and testing and the formation of a multi-agency group to address rising national VTEC rates.

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AN OUTBREAK OF *LISTERIA MONOCYTOGENES* DUE TO CONSUMPTION OF PRESSED BEEF

Sam Rowell¹, Corinne Amar³, Andrew Fox², Kenneth Lamden¹

¹*Cumbria and Lancashire Health Protection Unit, Lancashire, UK,*

²*Health Protection Agency Food Water and Environment Laboratory, Preston, UK,*

³*Health Protection Agency Microbiology Services, London, UK*

Outbreaks of listeriosis are uncommon and can be difficult

to investigate because of limited information on food exposures, absence of food samples and complex food distribution networks. However the use of discriminative and rapid molecular typing methods for *L. monocytogenes* are enhancing our ability to identify food sources. Fluorescent amplified fragment length polymorphism (fAFLP) typing made an important contribution to the investigation of an outbreak of listeriosis in Lancashire and Greater Manchester in July 2012.

Four cases of *L. monocytogenes*, serotype 1/2a fAFLP type XI.23 arose over a two week period. Two of the cases died. Case investigation identified consumption of pressed beef (also known as beef stew or potted beef) as the likely vehicle. The outbreak strain was isolated from thirteen food and environmental samples. The likely source was a meat processing factory that supplied shops, cafes and market stalls. There was insufficient evidence to instigate a product recall however after a deep clean of the factory no further cases arose. The investigation uncovered problems unrelated to the outbreak including contamination of foods with other strains of *L. monocytogenes*, misleading labelling and unauthorised extension of shelf life.

The investigation illustrates the importance of rapid molecular typing as a tool for investigating outbreaks of listeriosis and the value of food sampling. An unresolved issue is storage of long shelf life meat products. Although food business operators have a

duty to ensure temperature control it is difficult to provide the level of evidence required by EHDs to validate this throughout the distribution chain.

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AN OUTBREAK OF LISTERIOSIS IN SOUTH YORKSHIRE ASSOCIATED WITH THE CONSUMPTION OF PORK PIES

Nachi Arunachalam¹, Corrine Amar¹, Wendy Phillips¹, Suzanna Mathews¹, Rosemary McNaught¹, Jarrod Wilkinson², Nick Wellington³, Janice Manning⁴, Michael Bluff⁵, Heather Aird¹, Kathie Grant¹, Jim McLaughlin¹, Adedoyin Awofisayo¹, Rob Johnston¹, Charlotte Hutchinson¹

¹Health Protection Agency, England, UK, ²Barnsley Metropolitan Borough Council, Barnsley, UK, ³Doncaster Metropolitan Borough Council, Doncaster, UK, ⁴Rotherham Metropolitan Borough Council, Rotherham, UK, ⁵Sheffield City Council, Sheffield, UK

A case of meningitis in South East England caused by *Listeria monocytogenes* fAFLP type 4.I.74 occurred in July 2012 with a possible link to consuming pork pie manufactured in South Yorkshire. National surveillance identified an additional 13 listeriosis cases with indistinguishable or very similar (fAFLP types i.e. 4.I.74 and 4.I.79) between 2010 and 2012, 8 of which occurred in 2012. Excluding the index case, all cases occurred in South Yorkshire or the East

Midlands but none in the North West also supplied by the manufacturer. Food consumption history from nine patients, reported consuming pork pies of different brands: cluster analyses indicated that the two *L. monocytogenes* types were significantly associated with pork pie consumption (OR: 16.4 (3.20 - 113.2), $p < 0.0001$).

Environmental investigations were conducted by local Environmental Health Departments at the pork pie manufacturer and five retailers identified as potential sources. Following extensive microbiological testing, *L. monocytogenes* type 4.1.79 was recovered from a drain grate and a pork pie collected from the manufacturer and from pork pies from two retailers supplied by the manufacturer. As a precaution, the manufacturer voluntarily suspended production, recalled a batch of products, conducted a deep clean of their site and reviewed their production practices.

A review of national surveillance data in March 2013 did not identify any further cases due to *L. monocytogenes* types 4.1.74/4.1.79. Whole genome sequencing of isolates from both food and patients indicated that types 4.1.74 and 4.1.79 were indistinguishable. Ongoing regulatory and industry efforts are needed to decrease the presence of *L. monocytogenes* in ready-to-eat foods.

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FLU VACCINATION IN ELDERLY CARE HOME RESIDENTS - ARE WE REALLY LEARNING THE LESSONS FROM PAST OUTBREAKS?

Leena Inamdar¹, Jane Reid¹, Clare Humphreys¹, Shirley Brierley², Linda Scott²

¹West Yorkshire Health Protection Unit, Leeds, UK, ²NHS Airedale, Bradford and Leeds, Bradford, UK

Introduction: A significant flu outbreak in a care home in Bradford during Christmas 2011 was associated with low flu vaccination coverage among the elderly residential care population while nursing care patients were relatively less affected due to good coverage of flu vaccination.

Method: An outbreak control group was convened with antivirals prescribed for treatment and prophylaxis. Flu vaccination coverage was reviewed and reasons for poor flu vaccination were explored.

Results: 66 out of 142 residents and staff were affected, with 7 Influenza A H3N2 cases virologically confirmed. There were 7 hospitalisations and 10 deaths. 14 of 44 residents had received flu vaccination. Majority of cases were from the residential unit who had not received flu vaccine. Cases in nursing units remained low due to better vaccination coverage. None of the staff had received the flu vaccine and approximately 30% of staff was affected which severely impacted the business. Cost analysis on lost income due to staff sickness and empty beds has highlighted need for flu vaccination of staff and residents. The HPA and NHS worked very closely with the care homes

forum to raise awareness about flu vaccination, provide staff vouchers for flu vaccination and develop tools for outbreak management.

Conclusion: Although flu outbreaks are seen every year in care homes, there needs to be clear ownership of the responsibility for flu vaccination administration, particularly to dementia patients in care homes, with a co-ordinated approach to flu vaccination of care home residents and staff. These outbreaks present same old challenges, but do need innovative solutions.

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NOSOCOMIAL TRANSMISSION OF TB IN A UK HOSPITAL

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Background: We describe the investigation of a 36-year old white British healthcare worker who was diagnosed with smear positive TB in December 2012. This resulted in the emergence of a hospital based TB cluster.

Methods: Contacts of the healthcare worker within the hospital were identified and a risk assessment was undertaken to select those at significant risk and to offer them screening. An incident control meeting was held which brought together the relevant teams within the hospital.

Results: VNTR results from a sputum sample confirmed that she was part of a cluster of three other cases. Further investigation established a link between these patients: They had all been admitted to the same bay on a Clinical Decisions Unit in November 2011.

Patient 1 (88 years) was sputum smear positive 4+ in November 2011. She was subsequently nursed on the ward of the diseased healthcare worker for two months. Patient 2 (82 years) was diagnosed with pleural TB in May 2012. Patient 3 (22 years) was diagnosed with miliary TB in December 2012.

Contacts for all of the patients were identified and a total of 266 patients and staff were invited for screening. All other contacts were sent information letters with reassuring advice.

Conclusion: This is an exceptional situation because nosocomial transmission of TB is rare in the UK. A healthcare worker acquired active TB as did at least two patients admitted to hospital with unrelated diseases. A detailed investigation is still underway and the screening results are awaited.

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BIRMINGHAM OR BRADFORD-TB STRAIN TYPING CLUSTER INVESTIGATIONS ARE RESOURCE INTENSIVE

Leena Inamdar¹, Jharna Kumbang², Rebecca Ingham¹, Roger Gajraj², Huda Mohammed², Ruth Frizzell³

¹West Yorkshire Health Protection Unit, Leeds, UK, ²West Midlands Health Protection Unit, Birmingham, UK, ³Bradford Teaching Hospitals Foundation Trust, Bradford, UK

Introduction: We describe the impact of TB strain typing cluster investigation on Health Protection Units (HPUs) in two different English regions with similar population demographics and comparable high burden of TB.

Method: Both HPUs undertook extensive TB clusters investigations jointly with TB nurses. Cluster investigation questionnaires were completed, with home visits to identify risk factors and epidemiological links between cases.

Results: The Bradford cluster had 16 cases of which 8 had same postcode. Potential links investigated included street working, drug use, snooker halls and worship places but none had direct epidemiological links.

In Birmingham, clusters had 4-17 cases. One cluster involving six patients had two family members; four with same post code, three students linked to local school. No direct link was established among cases.

Investigation included information collection, risk assessment, home visits and incident meetings.

Bradford cluster included hard-to-reach patients, needing 70 HPA hours, 30 TB nurses hours, and 6 TB physician's hours. Birmingham investigation required 15 TB nurses hours, 3 CCDC hours and 2 chest physician's hours.

Conclusion: Although responsibilities were allocated differently, with the local unit assuming a greater operational role in Bradford, both investigations demonstrated the significant resource requirements. No chains of transmission were identified and no evidence uncovered to suggest secondary transmission. There is a need to examine cost-effectiveness of cluster investigations to identify appropriate resources needed for such intensive investigations.

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Tuesday 14 May 2013

SESSION 2

Surveillance – Seeing the Wood for the Trees

**FROM RESEARCH TO DELIVERY:
REAL TIME HEALTH PROTECTION
SURVEILLANCE FOR THE LONDON
2012 OLYMPICS AND PARALYMPICS**

Ruth Gelletlie¹, Chakib Kara-Zaitri²,
Martin Schweiger¹

*¹Dept for Gastrointestinal, Emerging
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Colindale, ²inFact, Saltaire, West
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Background: The Health Protection Agency (HPA) accepted responsibility for providing a health protection service focused on the needs of the Olympics and Paralympics to cover athletes, support staff, games visitors and the public. A key objective was to ensure that potential threats were identified and prevented or effectively managed. A dedicated HPA team was set up to research and plan for the event. It was recognized that a national-wide real time surveillance system was required.

Method: Requirements for the surveillance system were reviewed, specified and delivered through enhanced versions of HPZone and HPZone Dashboard to cover the Olympics. A pre-Olympic Exercise, was used to test the enhancements and allowed some fine tuning including more attention to defining

relevant Olympic context categories.

Results: The enhancements developed provided alerts to the Olympics team anytime the HPA received a report of a case, enquiry or outbreak had a linked Olympic context, with associated situation reports automatically triggered. Real-time coincidence alerts also proved an effective tool for exploring common factors including location and nationality. Developments delivered for the Olympics can readily be applied to real or simulated national events.

Conclusions: The combined use of local HPZones and the national Dashboard provided real time surveillance information for those responsible for managing the health protection aspects of the Olympics. HPZone enabled frontline staff to play an important role in ensuring a safe environment for the Olympics to proceed.

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**CONFIRMED CASES OF MEASLES IN
CHILDREN UNDER THE AGE OF 1 YEAR
NORTH WEST ENGLAND, 2007 - 2012**

Alex Keenan¹, Sam Ghebrehewet¹,
Roberto Vivancos²

*¹Cheshire & Merseyside Health
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Epidemiology Unit, NW, UK*

Introduction: Measles is highly infectious, mainly affecting children. Prevention is achievable through vaccination. Maternal antibodies are protective for children under the age

of 1 year but these wane after the first year of birth. COVER data gives us information on uptake rates both nationally and locally. Within the NW the uptake is below the 95% level as recommended by the WHO to achieve herd protection.

Methods: Anonymised data were extracted for all confirmed measles cases under the age of 1 in the NW from 2007 - 2012 inclusive.

Results:

- 196 confirmed cases of measles under the age of 1 were reported in the NW from 2007 - 2012 inclusive.
- 85% of confirmed cases of measles were in those aged between 6 and 12 months.
- For 95% of cases, exposure was most likely to have occurred during outbreak situations.

Conclusions: We are proposing that in outbreak situations MMR be used as a preventative measure for children between 6 months and 12 months of age in the geographical area of the outbreak, and that the standard immunisation schedule of MMR1 be undertaken again at 13 months.

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THE MOLECULAR EPIDEMIOLOGY OF *MYCOBACTERIUM TUBERCULOSIS* IN SCOTLAND BETWEEN 2000 AND 2012

Tara Shivaji¹, Fiona Johnston², Amie-Louise Seagar³, Ian F Laurenson³, Alison Smith-Palmer²
¹NHS Highland, Inverness, UK, ²Health Protection Scotland, Glasgow, UK, ³Scottish Mycobacteria Reference Laboratory, Edinburgh, UK

Background: With an annual incidence of 8.6 cases per 100,000 population in 2011, rates of TB notification in Scotland are lower than the UK as a whole. However, unlike the rest of the UK, TB incidence increased by 38% from 2005-2010. Molecular epidemiology offers a means of identifying risk factors and characteristics associated with recent transmission of TB in Scotland and could offer an insight into improving TB control practices.

Methods: This was a retrospective cohort study using Enhanced Surveillance of Mycobacterial Infections (ESMI) data and molecular strain typing data, 24 locus MIRU-VNTR profiles of *M. tuberculosis*. The two datasets were linked using unique patient identifier codes. We compared patient characteristics of clustered and non-clustered strain types.

Results: There were 31 strain type clusters involving 2 to 21 individuals. 73% of individuals in a strain type cluster were male. Most cases occurred in the 45-54 year age group. 69% of individuals in a strain type cluster were born in the UK and 82% were of white ethnicity. Homelessness (OR 2.42

95% CI 1.03 - 5.65) and alcohol use (OR 2.33 95% CI 1.32 - 4.10) were significantly associated with involvement in a strain type cluster containing 4 or more persons.

Conclusions: Large strain type clusters of TB in Scotland tend to be comprised of individuals who are white, male, and socially complex. Migration from high prevalence countries contribute to the overall TB burden but do not appear to significantly contribute to ongoing transmission in Scotland.

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EPIDEMIOLOGY OF MYCOBACTERIUM BOVIS IN HUMANS AND CATTLE IN NORTHERN IRELAND, 2000-2012.

Cathriona Kearns¹, N Clarke², M Devine¹, B Smyth¹, L Doherty¹, P O'Neill¹

¹Public Health Agency, Northern Ireland, UK, ²Department of Agriculture and Rural Development, Northern Ireland, UK

Introduction: *Mycobacterium bovis* can cause TB in humans and is the principal cause of bovine TB. While *M. bovis* infection in animals and humans is relatively uncommon, it remains an important zoonotic infection.

Aim: Review epidemiology of *M. bovis* in human and cattle populations in Northern Ireland to examine evidence of transmission.

Method: Human TB cases caused by *M. bovis* reported to the Public Health Agency Enhanced Tuberculosis

Surveillance scheme and animal disease statistics from DARDNI for Northern Ireland between 2000 and 2012 were reviewed.

Results: 22 human cases of *M. bovis* reported 2000-2012 ($\approx 3\%$ of human TB cases), mean age 60 years (range 20-89 years), 50% of cases older than 60 years. 27% of cases lived on a farm with 27% also consuming unpasteurised products. Annual incidence of bovine TB in herds 7.32% (range 5-10%), annual animal incidence 0.66% (range 0.4-0.9%). Diagnostic disclosure in live cattle increased sharply (40%) in last 2 years following a significant decrease in previous 7 years. There were 1,386 new reactors herds in N. Ireland in 2011, but no significant increase in disclosure of disease at post mortem examination of cattle for human consumption.

Conclusion: Eradication of TB in animals to control human infection remains a subject of discussion. Public health response for contacts of infected animals is based on a risk assessment (NICE TB Guidance). The human epidemiology of *M. bovis* does not indicate recent transmission from animals with current infection in N. Ireland suggesting that current public health approach is appropriate.

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ENHANCED SURVEILLANCE OF VEROCYTOTOXIN-PRODUCING *ESCHERICHIA COLI* IN ENGLAND: 2009-2012

Lisa Byrne, Claire Jenkins, Richard Elson, Naomi Launders, Bob Adak
Dept for Gastrointestinal, Emerging and Zoonotic Infections, HPA Colindale

In England, verocytotoxin-producing *Escherichia coli* (VTEC) are relatively rare but important gastrointestinal pathogens of significant public health concern, due to their association with severe disease.

In the UK and Ireland, the largest number of cases is reported in England, where laboratory surveillance has been undertaken for over 20 years. Scotland, Wales and Ireland have undertaken enhanced surveillance for several years, while an enhanced surveillance system was first introduced in England on 1st January 2009.

The first four years of data indicate the incidence of VTEC and haemolytic uraemic syndrome (HUS) remains highest in children aged under 5 years and that adult females have a higher incidence than males. Rates of infection vary regionally and are higher in rural areas than urban areas. The majority of VTEC belonged to serogroup O157 and phage type (PT) 21/28 was most frequently detected although PT8 was most common in travel-related cases. Exposure history data indicate that contact with animals, eating out and consumption of beef products are most frequently reported among cases. A third of cases were hospitalised and 6%

developed HUS.

The system serves as a repository for clinical, epidemiological and microbiological case data and is, therefore, an invaluable public health resource. Over time, surveillance will allow analyses of longer term trends including emerging subtypes and risk factors. Bringing England's surveillance of VTEC in line with Scotland, Wales and Ireland will facilitate co-ordinated public health action and the elucidation of the epidemiology of VTEC and HUS among these countries.

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HOW MANY?! NOROVIRUS SURVEILLANCE: WHAT WE SAW IN THE FIRST THREE SEASONS

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Norovirus is the commonest cause of gastrointestinal infections in the United Kingdom (UK). A recent national study suggested that there are around 3 million cases annually. Within semi-enclosed settings (e.g. hospitals, care homes, cruise ships) the virus can cause widespread disruption, particularly as it is able to survive for long periods in the environment, has a low infectious dose and immunity to infection is short-lived. The financial cost to the NHS of gastrointestinal outbreaks is estimated to be around £115 million per year.

In 2009 the Health Protection Agency introduced a voluntary web-based system to collect information on suspected/confirmed outbreaks of norovirus in England. Each NHS Trust was invited to participate, with data entered by infection control staff in hospitals. This is the first comprehensive dataset to demonstrate the impact of norovirus in hospital settings in the NHS in England.

In the first three seasons there were 4,712 outbreaks, 82% of which resulted in ward or bay closures and 68% of which were laboratory confirmed. Each outbreak had an average (mean) length of closure of 9 days and between 23 and 25 bed days lost, with 10 patients and between 2 and 3 staff members affected.

This system provides clear evidence of the burden of norovirus outbreaks to National Health Service (NHS) hospitals. The system also provides a more timely assessment at the national level of the incidence and impact of norovirus outbreaks to NHS hospitals in England.

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Tuesday 14 May 2013

SESSION 3

Bloodborne Viruses and Sexually Transmitted Infections – Home and Away

DEVELOPING A BEST PRACTICE GUIDANCE TOOLKIT FOR TATTOOING AND SKIN PIERCING PRACTITIONERS AND THEIR PREMISES THROUGH MULTI-AGENCY COLLABORATION

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Tattooing and body piercing have become popular and fashionable throughout the 5 nations with an increasing range and availability of procedures.

However, there are well reported health risks which can be attributed to these procedures. Improper practice and poor infection prevention and control may result in localised skin infections at the site of the tattoo or piercing. There is also the risk of transmission of blood-borne viruses such as hepatitis B and C and HIV which can have serious and long term health consequences. Ensuring practitioners follow safe working practices is important for protection of both clients and practitioners.

Despite a variety of legislation being

introduced, longstanding concerns have been raised by tattoo and body piercing practitioners and health protection/environmental health specialists about the lack of robust and consistent guidance on standards of hygiene and safety leading to inconsistency in advice and variations in standards of practice.

This on-line, interactive Tattooing and Skin Piercing Guidance Toolkit has been developed by a multi-agency steering group comprising representatives from the Chartered Institute of Environmental Health, Health Protection Agency (England), Health and Safety Laboratory, Tattoo and Piercing Industry Union and also individuals with practical experience of working in this area as expert advisors, practitioners or regulators.

The guidance is supported by extensive documentary evidence of scientific knowledge, reported research and published literature encompassing expert advice and the opinions/experience of practitioners of what works at a practical level. It is also hoped the toolkit will influence development of training standards.

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COINFECTION AND RISK FACTORS FOR FOUR PREVALENT STIs IN IRELAND

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Background: Little has changed

in STI epidemiology in Ireland since 2000. Three STIs comprise approximately 90% of notifications; ano-genital warts (GW), *Chlamydia trachomatis* (CT) and non-specific urethritis (NSU). Ireland has no sexual health strategy. Our objective was to compare the risk factors for four STIs in attendees at two STI clinics and examine the incidence of coinfection.

Methods: Diagnostic, demographic and behavioural information on attendees at two clinics in southwest Ireland were collected from January 1999-July 2009. Chi-squared tests examined differences in demographic and behavioural characteristics across clinics, stratified by sex. Multivariable logistic regression, applying backward elimination, investigated the combination of risk factors associated with first episode GW, genital herpes simplex viral infection, NSU and CT.

Results: 22,705 STI patients (mean age 27yrs), received 26,824 diagnoses. 1628 had more than one infection. GW was most likely to be associated with a coinfection. Having multiple partners was positively associated with a diagnosis of bacterial infection but not viral infection.

Discussion: Our large cohort outlines those at risk in the region, showing age and gender influences the risk and type of infection. Smoking, alcohol and drug use is also common, all regarded as markers of risk-taking behaviour. The younger the age, the higher the risk of acquiring infection, regardless of infection type. Prevention strategies

that target youth, bacterial STIs and high-risk behaviour, including sexual, alcohol and drugs, may be effective in reducing STI incidence in Ireland. This study provides a reference for evaluation of the impact of the HPV vaccine which was rolled out in Ireland in 2010.

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HOME DELIVERED DRIED BLOOD SPOT TESTING - ASSESSING THE IMPACT ON SCREENING UPTAKE FOR HOUSEHOLD CONTACTS OF HEPATITIS B INFECTED PREGNANT WOMEN.

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Introduction: Despite, national recommendations to screen household contacts (HHCs) of hepatitis B infected pregnant women, implementation is sub-optimal. Testing of home collected capillary blood as dried blood spots (DBS) offers an alternative to conventional follow up in primary care. This study aims to assess the impact of using home DBS testing to improve the screening uptake of HHCs.

Methods: Population: HBsAg positive pregnant women identified through antenatal screening at a London maternity unit during audit (01/01/2009- 31/12/2009) and study (01/11/2010-31/12/2011) periods.

Audit: Retrospective review of general practitioner (GP) records to determine uptake of screening of HHCs.

Study: Home DBS testing for HHCs who had not previously been screened. First dose of vaccine was offered to HHCs <16 years; HHCs =>16 years were referred to primary care for vaccination. DBS samples were sent to HPA for HBsAg testing.

Results: Audit: 41 women with 91 known HHCs were identified. Overall 46/91 (51%) were screened, (32/53 children; 12/33 partners; 2/5 'Other adult') and one HBsAg positive contact (partner) identified.

Study: 58 women with 169 known HHCs were identified. Overall, 167/169 (99%) were screened by DBS (86/86 children; 54/56 partners; 27/27 'Other adult'). 53 (31%) contacts screened were HBsAg positive (3 (6%) children; 35 (66%) partners; 15 (28%) 'Other adult')

Conclusions: This is the first UK study to investigate the effectiveness of home DBS testing to screen household contacts of HBsAg positive pregnant women. These findings suggest home DBS testing particularly improved screening uptake for partners, increasing from 36% to 96%.

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AN AUDIT OF THE CLINICAL PATHWAY FOR PATIENTS DIAGNOSED WITH HEPATITIS C IN MID ESSEX BETWEEN JAN 2007 AND FEB 2010

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Aims: To map current arrangements for management of patients with hepatitis C from testing to treatment and identify gaps to make recommendations for improving services.

Methods: We identified all positive results for anti-hepatitis C antibodies between Feb 2007 and Feb 2010 and conducted a questionnaire survey of the referring clinicians for every positive patient. A clinician at the regional specialist hepatology centre was interviewed.

Standards: Recommendations from Public Health Hepatitis C Annual Report 2009, NICE guidelines TA 106 and RCGP guidelines 2007.

Results: Of the 11075 tests for Hepatitis C, 218 results on 148 patients were positive. 72 of these were new cases, of which only 53/72 (74%) were referred for hepatitis C RNA testing to identify those currently infected. 36 (68%) of these tested positive.

Only 83% of RNA positive patients were referred for specialist treatment. Treatment was not commenced in 27% patients (either awaiting results or too unstable). Only 79% had follow up with the specialist centre.

Documentation on genotype results, treatment initiation, outcomes and follow up was poor; 33% patients had no documentation at all.

There was no agreed pathway or clinical network. There was a consistent lack of clarity among referring clinicians about when and where to refer.

Recommendations:

1. Develop and agree a clinical pathway across primary and secondary care and laboratory services.
2. Develop mechanisms for routine reporting of data on attendance rates and treatment outcomes.
3. Explore patient views on existing services and need for a locally led hepatology service.

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Wednesday 15 May 2013

SESSION 4

Vaccine Preventable Diseases: Injecting some common sense into disease prevention

OUTBREAK OF MEASLES IN A PRISON IN NORTH YORKSHIRE

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Background: This outbreak took place in the context of a small Category C/D prison in North Yorkshire with a population of 210 offenders (median age 26 and mainly white British ethnicity).

Description of outbreak: Following identification of the index case the prison were advised to be vigilant for secondary cases and to isolate early. An outbreak was declared following the identification of a second probable case. The prison was advised to cease transfers and a strategy of mass vaccination was commenced for all the staff and offenders whose immunisation status was unknown. In total 191 offenders and 71 staff received MMR vaccination. Active follow up of the small number of offenders who had been transferred to other prisons prior to the outbreak being declared did not identify any spread within the prison system. In total there were 8 confirmed cases of measles linked to the outbreak.

Discussion: Following the conclusion of the outbreak, staff from the HPU completed the work to ascertain the prior MMR status of the under 25s at the time of the outbreak. This showed 89% had a record of at least one MMR in childhood (50% had two MMRs). When this is taken into account the attack rate in the under 25s in the prison with no record of any previous MMR vaccination was 63%. The relatively high pre-existing vaccination coverage was likely to have limited the size of the outbreak.

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THE DANGERS OF DELAYING AND DEFAULTING CHILDHOOD IMMUNISATIONS - THE CHALLENGE OF SCHEDULE CHANGE.

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There was an unexpected decline in the uptake of immunisations at 12 and 13 months in Ireland, following the July 2008 amendment to the childhood immunisation schedule to allow for the introduction of two new vaccines.

In North-West Ireland analysis of age at immunisation and number of vaccines received at each visit was conducted on a representative sample of children (890/3,870) born in the year following schedule change. A cross-sectional survey was used to gather information from parents (248/890).

Defaulters of immunisation were

not refusing immunisations, but rather opting to have immunisations at 2, 4, 6 months whilst defaulting on those at 12 and 13 months (MenC and Hib). Furthermore, a statistically significant proportion of defaulters were considerably older at immunisation than the non-defaulter group ($p < 0.001$). Defaulters were significantly more likely to split administration of immunisations that should be given on the same GP visit; 34% split the 6 month immunisations ($p < 0.001$). The non-defaulter group also delayed and split immunisations to a lesser extent; 22% delayed the 13 month immunisations until over 18 months, 6% split administration of the 6 month immunisations.

Several factors were significantly associated with poor immunisation uptake: larger family size ($p = 0.012$), moving GP ($p = 0.025$), using a childminder ($p = 0.012$), lack of awareness of the schedule ($p < 0.001$), not using the parent-held immunisation record ($p = 0.036$), and concerns with vaccine safety ($p = 0.007$).

These findings have implications for policy and practice with regard to provision of effective immunisation services for children in Ireland, and above all preventing illness such as meningitis.

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CHANGING EPIDEMIOLOGY OF MUMPS IN NORTHERN IRELAND

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This paper describes the changing epidemiology of mumps cases in Northern Ireland (NI) across three outbreaks from 2000 to 2012-13.

Details of the 2000 outbreak have been previously published (Reaney et al, *Commun Dis Public Health* 2001; 4: 257-61). Surveillance data on laboratory confirmed mumps cases from 2005 and 2012-13 was examined. Demography data is obtained directly from the laboratory system and MMR status is retrieved from the electronic Child Health System (CHS).

Confirmed case numbers in each outbreak were: 2000 - 332, 2005 - 852, 2012-13 239 (to date, outbreak ongoing). The ages affected have risen. The median age of cases increased from 14 in the 2000 outbreak (range 2-68), to 19 in 2012-13 (range 7-90). The proportion of cases aged 20-24 years increased from 1.2% of cases in 2000 to 20% of cases in 2005, to 34% of cases in 2012-13. The M/F ratio has increased from 1.3:1 in 2000 to 1.4:1 in 2012-13.

The most significant finding is the marked increase in the proportion of cases with two MMRs which increased from 0.9% in 2000, to 19.5% in 2005, to 72% of 2012-13 cases.

The epidemiology of confirmed mumps cases in NI is changing with

higher numbers of older people being affected as well as higher proportions of fully vaccinated cases. The consistently high uptake of MMR in NI has proven protective against large measles outbreaks. This data shows that it has not been as effective at preventing mumps outbreaks. The reasons for this require further exploration.

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**IMPACT OF WRITTEN
CORRESPONDENCE WITH GENERAL
PRACTITIONERS ON LABORATORY
CONFIRMED PERTUSSIS
NOTIFICATIONS IN NORTHERN
IRELAND**

Jillian Johnston, Richard Smithson,
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Aim: This study aimed to measure the impact of written correspondence with general practitioners (GP) on laboratory confirmed pertussis notifications in Northern Ireland.

Method: Surveillance of laboratory confirmed cases of pertussis is carried out by the Health Protection Division of the Public Health Agency (NI). Age-specific laboratory confirmed cases were extracted for 2012. A written letter was sent to all GPs on 12 April 2012 informing them of pertussis and ensuring they considered the diagnosis. Descriptive analyses were performed and comparisons made before and after 12 April.

Results: 314 cases were reported

in 2012. Notifications increased monthly from a mean of 9 cases/month (range 5-11), before the letter, to a mean of 32 cases/month (range 14-47) after.

Before the GP letter 62.9% of cases were in babies under 3 months. No change was seen in the monthly number of cases in those under 3 months (mean 6, range 4-8; versus mean 6, range 3-11). Cases increased in all other age groups, with cases over 25 years showing a significant increase from 0.3 cases per month to 12 cases per month.

Conclusions: This study shows a marked increase in the number of laboratory confirmed pertussis notifications following written communication with GPs, particularly in those over 25 years.

Written communication with primary care can have a significant effect on changing clinical behaviour, improving case ascertainment and surveillance, thus enabling more complete public health actions.

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FIRST EVIDENCE OF PREVALENCE OF HUMAN PAPILLOMAVIRUS (HPV) INFECTION IN MEN WHO HAVE SEX WITH MEN (MSM) IN IRELAND: A STIMULUS FOR VACCINE REVIEW

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Background: In Ireland, no data exist on the prevalence of HPV infection in men. Emerging patterns of HPV related disease including anal and oropharyngeal cancers, particularly in at risk groups such as MSM, strengthen the call for universal or targeted vaccination. Documenting the molecular epidemiology of HPV is essential to formulating national vaccine guidelines.

Methods: A prospective cohort study was conducted looking at prevalence and predictors of anal HPV infection. HPV was detected using consensus primer solution phase PCR followed by type specific PCR.

Results: 194 MSM (mean [SD] age 36 [10] yrs, 51% HIV⁺) were recruited. Median number of reported sexual contacts in the preceding 12 months was 4 [IQR 2-10]. HIV⁺ subjects had a mean CD4 count 557 [SD 217] cells/mm³, 84% were on HAART.

31 samples were B-globin negative and thus excluded from further analysis.

113 (69%) had detectable HPV DNA. HPV 16 was detected in 44 (27%) and HPV 18 in 26 (16%) samples. 10 (6%) had both HR HPV types 16 and 18 detected.

When HPV and HR HPV were stratified by age those >30 years had a higher prevalence (77%vs50% p=0.001 and 45%vs18% p=0.001).

HIV⁺ subjects were more likely to have any detectable HPV (77%vs60% p=0.03), to have HR HPV types 16 or 18 (44%vs27% p=0.011) or to be infected by >1 HR HPV (10%vs0%, p<0.001).

Conclusion: A high prevalence of anal HPV was found in our cohort. Clarifying baseline prevalence of HPV infection is important in guiding prevention strategies in relation to HPV vaccination.

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Wednesday 15 May 2013

SESSION 5

Environmental Change and the Four Furies – Fire, Flood, Freeze and...wee beasties!

Invited Speaker

FRACKING – WHAT IS IT?

Anthony Breslin
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The presentation will give the basis facts on what fracking involves, the different regulatory regimes in Europe and the USA, and discuss the implication for communities in the UK and Ireland if exploration becomes a reality.

WATERBORNE VEROTOXIN PRODUCING *ESCHERICHIA COLI* OUTBREAKS IN THE IRISH MIDLANDS 2011 AND 2012

Ina Kelly², Una Fallon¹, Margaret Cosgrove¹, Aine McNamara¹, David Weakliam¹, Caitlin Ni'Shuileabhan¹, Phil Jennings¹

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The Midlands has the highest VTEC notification rate in Ireland - 29.4 cases per 100,000 versus 12 per 100,000 in 2012. This is compared

to the European rate, in 2010, of 0.83 per 100,000.

We have had three waterborne community VTEC outbreaks from small private regulated drinking water supplies. In August 2011, an outbreak of 38 cases of *E. coli* O157 resulted in seven hospitalisations, 1 with haemolytic uraemic syndrome (HUS). In August 2012, out of 250 people on a private housing estate, there were 11 cases of *E. coli* O157 with 1 hospitalisation. A third outbreak in 2012 involved 5 cases of *E. coli* O157, plus 2 people with bloody diarrhoea who tested negative.

During 2012, there were several smaller outbreaks on water supplies which are exempt from regulation. In a community outbreak of 4 cases, the index case, who developed HUS, was exposed to a well contaminated with the same VTEC (*E. coli* O26). Five of seven wells tested as part of this investigation were found to be contaminated with coliforms or *E. coli* but not VTEC. In another, the index case, visiting from an urban area, was exposed to 7 contaminated private wells.

Risks to be discussed include the complex governance of Irish water supplies, the proportion of Irish people served by private wells (12.3%), high prevalence of well contamination, breakthrough contamination and severe weather events, private water supplies in new housing estates and the risk of food businesses switching from public supplies to private pre-existing wells.

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EXTREME EVENTS AND HEALTH PROTECTION - WHAT ARE THE CHALLENGES FOR PUBLIC HEALTH?

Virginia Murray

Extreme Events and Health Protection at Public Health England

Climate change is an economic, social and environmental challenge that cuts across every sector of society resilience, including health and wellbeing. The Climate Change Act (2008) requires the UK Government to publish a National Adaptation Programme, which will include a section on health and wellbeing (including social vulnerability and community resilience), following the publication of a Climate Change Risk Assessment (2012). This identified for health that

- Hotter summers are projected to increase the risk of heat-related death and illness.
- The number of casualties due to flooding and the impact of floods on mental wellbeing are both projected to increase.
- Milder winters are projected to result in a major reduction in the risk of cold-related death and illness.

As part of addressing these issues for public health, in January 2011 the HPA set up the Extreme Events and Health Protection Section (EEHP) to provide a focal point for evidence based advice for extreme weather events and other natural hazards at local, national and international levels. By collating relevant information from within HPA and from academic and other partners at local, national and international

levels, EEHP provides up-to-date evidence based information to support the development for adaptation, planning, response and recovery to extreme events. For this purpose an extreme event can be defined as any extreme weather event or other natural hazard including flooding, drought, cold, heat, earthquakes and volcanic ash with the potential to cause adverse impacts on human health. EEHP collaborates closely with climate change and sustainability partners.

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Wednesday 15 May 2013

SESSION 6

Hot Topics

WIDESPREAD SUBCLINICAL ABNORMAL PRION PROTEIN IN A SECOND UK SURVEY OF ARCHIVED APPENDIX SPECIMENS

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Angela Richard-Loendt³, Carole
Kelly¹, Reza Dabaghian¹, Lynnette
Boyes³, Jaqueline Linehan⁴, Marion
Simmons², Paul Webb², Peter
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National Creutzfeldt-Jakob Disease
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Background: Dietary exposure in the UK
to bovine spongiform encephalopathy
prions in the late 1980s and early
1990s led to the emergence of variant
Creutzfeldt-Jakob Disease (vCJD).
This prion disease is distinguished
by accumulation of vCJD prions in

spleen, tonsils or lymphoid tissue
of the gastrointestinal tract, before
invasion of the central nervous
system. Prevalence of vCJD carrier
status in the UK population has been
estimated through screening archival
appendectomy and tonsillectomy
specimens. Due to differences
between previous studies, a second
large scale survey of appendix tissue
was undertaken.

Methods: Tissue from 2000-2012
appendicectomies was collected from
pathology departments throughout
Britain and tested for abnormal prion
protein by immunohistochemistry
using the unlinked-anonymous
technique.

Findings and interpretation: In 32441
formalin fixed paraffin embedded
appendix samples, there were 16
positive specimens, a prevalence of
370 per million population (95%
confidence interval of 191-646 per
million). The prevalence in 1941-
60 birth cohorts was similar to that
in 1961-1985 cohorts, and in both
genders and across the three broad
geographic areas sampled. PRNP
codon 129 genotyping of the 16
positive specimens revealed a high
proportion of 129VV compared to the
normal population, and contrasted
with confirmed clinical cases of
vCJD who have all carried the PRNP
129MM genotype. This study suggests
a remarkably high prevalence of
subclinical vCJD prion infection in
the population compared with the
176 vCJD cases to date. The findings
have important implications for the
measures to control blood and blood
product transmission, and for the
handling of surgical instruments.

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HUMAN MYCOBACTERIUM BOVIS INFECTION IN AN ABATTOIR WORKER IN THE UK

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Mycobacterium bovis (*M. bovis*) is the principal agent responsible for tuberculosis in domestic and wild animals. Human *M. bovis* infection is clinically indistinguishable from the prevalent form of human TB caused by *M. tuberculosis*.

We describe a public health investigation of a case of human pulmonary *M. bovis* infection confirmed from post mortem samples.

Screening of the patient's family and work contacts took place in summer 2012. Isolates from the cases were sent to the HPA reference laboratory for VNTR typing and AHVLA for genotyping against the specific types found in the cattle from the catchment area.

The index case was a British born cattle keeper in a high bovine TB incidence region. This patient's other risk factors included immunosuppression, unpasteurised milk consumption and working in an abattoir which slaughtered TB reactors.

Three out of 11 family contacts and one out of 39 work contacts

tested positive for latent TB. The spouse of the case was later confirmed to have *M. bovis* pulmonary infection.

The VNTR types for the two cases were identical and the spoligotype was a single VNTR locus variant of the commonly seen genotype 25:a stable in the local cattle population for last 10 years.

We found no evidence of transmission of TB to work contacts. It is unlikely that the index case acquired *M. bovis* infection from the practices in the abattoir and this was possibly reactivation of latent TB infection due to immunosuppression.

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THE CHALLENGES ENCOUNTERED IN THE PUBLIC HEALTH RESPONSE TO AN OUTBREAK OF NOVEL CORONAVIRUS (nCOV) IN THE WEST MIDLANDS

Ruth Harrell^{1,2}, Louise Dyke², Mamoona Tahir², Roger Gajraj², Madhu Bardhan², Musarrat Afza³, Robert Carr³, Nicholas Aigbogun³, Petra Charlemagne², Rea Alves², Keith Neal¹, Obaghe Edeghere¹, Harsh Duggal³, Huda Mohamed², David Kirrage⁴, Sue Ibbotson⁰

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In February 2013, the West Midlands East HPU was notified of a positive diagnosis of nCoV in a Birmingham resident, who had recently spent time in Pakistan and Saudi Arabia. Subsequently, two close family contacts who had not travelled were confirmed as secondary cases; providing the first clear evidence of person-to-person transmission.

We report on the local public health response to this outbreak, which involved the three West Midlands HPUs, in particular the challenges that were identified around contact tracing, coordination and communications:

- The public health response required contacts to be traced, interviewed and sampled; blood tests for all (immediately and 21 days later for serology), and nose and throat swabs and sputum samples in symptomatic contacts. The vast majority of contacts were based in the West Midlands and in excess of 100 contacts were traced and sampled. These included family and friends, flight passengers and a range of health care workers. The process of obtaining samples in the community, particularly for symptomatic contacts, was challenging; not least because sampling required FFP3 respirators for personal protection.
- The coordination of the different elements of the health care

system was complex, and emphasised the role of strong partnerships in responding to a novel disease. This requires consideration as we move into the new structures.

- Public interest in this outbreak was high. This led to difficulties in maintaining the level of confidentiality that the family desired, and affected the delivery of the public health response.

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Poster Abstracts

Outbreak! New Challenges, New Solutions

P-1

AN OUTBREAK OF SALMONELLA AGONA PT39 IN SOUTH YORKSHIRE

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Four cases affected with *Salmonella Agona* PT39 in February 2012 in Doncaster potentially linked to eating at a local pub initiated the investigation.

By June 2012, nine cases were reported. Five out of six cases from Doncaster and two out of three cases from Sheffield reported eating at their local pubs, which belong to the same chain of pubs.

Review of historical data showed that of the 28 cases that were notified in the UK in the years 2010 and 2011, 15 had occurred in Doncaster and 4 in Sheffield. 5 out of the 9 cases who had answered questions had reported eating at the pubs.

A survey of cases and their fellow diners in Doncaster in 2012 was conducted using standardised questionnaire developed using pub menu. 5 cases and 12 contacts (including 5 who were symptomatic but not tested) participated.

Consumption of pork was identified to be associated with statistically significant risk of acquiring salmonella infection (Risk Ratio: 2.75).

The pubs were inspected, advised to stop the use of unwashed parsley to garnish advisory notice issued. Meats slow cooked using 'Alto-sham' ovens were found satisfactory. Samples of raw and cooked meat (including pork), parsley, condiments, surface swabs and stool samples from all staff (none were symptomatic) were taken and found to be negative. Tracing back of the origin of key ingredients led to international suppliers.

No case since June 2012. Enhanced surveillance and case-case analysis with other *salmonella* cases for any commonalities is being implemented.

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P-2

MANAGEMENT OF A MYCOBACTERIUM TUBERCULOSIS CLUSTER IN A UNIVERSITY SETTING

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Setting and Methods: A cluster of four students with an indistinguishable strain of *Mycobacterium tuberculosis*, as identified by 24 loci MIRU-VNTR (mycobacterial interspersed

repetitive unit variable number tandem repeat) genotyping, was detected at the University of Sussex, of which three were smear positive. Initial close contact screening as part of routine case management suggested that transmission of infection to close contacts had occurred. More detailed index interviews using an adapted cluster questionnaire suggested a few epidemiological links between two indexes, though none elucidated an obvious path for infection to the other two cases. Consequently wider screening was initiated. Following a campus walk-around and scrutiny of course lists a group of 236 students and staff, who were classified into high and low risk, were invited to screening consisting of an interferon-gamma release assay (IGRA) blood test and a 'typical week diary' contact questionnaire for TB exposure collecting information on demographics, clinical symptoms and possible transmission sites. Non-attending subjects were followed up.

Results: 161 cases were screened over 2 days (68% of those identified), 10 had a positive screening result with a further 3 being borderline positive and 1 being indeterminate. Of those positive half were born in the UK. No further definitive epidemiological link was discovered. DNA sequencing of the index cases' isolates is awaited. Results of screening were managed following standard UK clinical practice. The proportion of students registered with a general practitioner was found to be less than 70%.

Conclusions: This investigation

highlights the importance of strong working relationships between health and educational facilities to ensure that the majority of those identified for screening attend. In addition, more should be done to inform students about local health care provisions and to inform students about the symptoms of TB. More research is needed into the costs versus benefits of screening programmes of this size and into the possibility for expansion of national guidelines to include university scenarios. The higher resolution of whole genome sequencing might provide a better understanding of transmission patterns.

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P-3

AN OUTBREAK OF LEGIONNAIRES' DISEASE ASSOCIATED WITH A DISPLAY SPA POOL IN RETAIL PREMISES, STOKE-ON-TRENT, UNITED KINGDOM, JULY 2012

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In July 2012 an outbreak investigation was initiated when two confirmed cases of Legionnaires' disease in residents of Stoke-on-

Trent were reported to the West Midlands North Health Protection Unit. A multi-agency outbreak investigation team directed the response. Control actions including assessment of registered cooling towers and case interviews regarding potential exposure sources and risk locations visited.

During the following two weeks 21 confirmed cases of Legionnaires' disease (*Legionella pneumophila* serogroup 1) were identified in the Stoke-on-Trent area of England with onsets since 2 July 2012. DNA sequence based typing identified a previously unrecognised strain (designated ST1268) in 9 patients. No other strain was identified.

The median age of cases was 64 years, 14 cases were male, and there were two deaths during hospitalisation. All cases reported visiting a retail store in Stoke-on-Trent where a spa pool was on public display. A swab sample from this spa pool tested positive for the same strain as the patients, ST1268. No other samples taken from any of the other sites tested positive for this strain.

Ten days after recognising the outbreak, the investigation team concluded that the spa pool at the retail store in Stoke-on-Trent was the most likely source of exposure for all cases. Case incidence declined rapidly after draining the spa pool. The use of sequence based typing methodology, sufficient clinical and environmental samples, and accurate case exposure histories were central to the success of this

investigation.

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P-4

A LOCAL PERSPECTIVE OF A NATIONAL CRYPTOSPORIDIOSIS OUTBREAK

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Aims: To describe the epidemiological investigation and response in West Yorkshire to a national outbreak of *Cryptosporidium parvum*.

Methods: A rise in cases of *Cryptosporidium* spp. was noted in West Yorkshire on May 23rd 2012. The outbreak control team initiated:

- Enhanced case finding and microbiological testing
- Completion of hypothesis generation questionnaires
- Mapping of cases against Water Supply Areas
- Informal enquires into supermarket supply chains
- Health advice to cases and reactive press statements

Results: In total 82 cases of cryptosporidiosis were reported in West Yorkshire during May 2012, 65 of which were typed as *C. parvum*. During the outbreak peak (May 11-18th) there was a higher

than expected proportion of female cases (67% v 50% expected) and adult cases (85% v 58% expected). Case finding quickly spread to other parts of Yorkshire (South Yorkshire 26 cases; North Yorkshire 32 cases) and the UK.

The temporal clustering and age-sex distribution of cases, and lack of common recreational or travel related source, meant a food source was suspected. Food questionnaires revealed that 88% of cases interviewed in West Yorkshire had shopped at a particular supermarket chain and that 88% had eaten pre-packed salad items. A national case-control study and investigation of supermarket food chains is ongoing.

Conclusion: This outbreak highlighted the difficulty of timely microbiological testing of perishable food items as the likely exposure was 1-9th May, dates of onset 11-16th May, and first outbreak meeting 24th May.

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P-5

INVESTIGATION OF A CLUSTER OF CASES OF GROUP A *STREPTOCOCCUS* (GAS) IN A RESIDENTIAL CARE HOME IN NORTHERN IRELAND, NOVEMBER 2012

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Introduction: Two confirmed cases of GAS were reported in a residential facility in Northern Ireland. One

case was hospitalised with Streptococcal Toxic Shock Syndrome and subsequently died. A third 'probable' case was hospitalised with cellulitis in the same eight-day period; bacteriological confirmation was not possible.

Method: The home environment and infection control practices were assessed. Staff completed a questionnaire regarding relevant symptoms. Residents and staff were screened by throat swab and, if indicated, skin lesion swab. Infection control advice was given and further training planned.

Results: Both confirmed cases were typed as emm st1.0 T-Type 1. 100% (21/21) residents, 92% (22/24) staff, and 91% (10/11) visiting staff were swabbed, and all were negative for GAS. No further cases have occurred.

Discussion: Initial risk assessment indicated potential transmission of GAS within a very short time-frame in a vulnerable, elderly, institutional population. Outbreaks are well-recognised in such settings. Microbiological typing supported transmission within the home, although emm st1.0 is the most common local type. This investigation supports the strategy of screening so that treatment can be targeted only at known carriage. It also offers insight into logistical considerations when organising mass sampling.

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P-6

DEVELOPING A RISK ASSESSMENT TOOL FOR TB EXPOSURE INCIDENTS IN HOSPITALS

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Risk factors for the transmission of TB are the same whatever the setting, however hospitals present further challenges. These include: the concentration of susceptible patients; exposure opportunities posed by certain types of procedures and opportunities for unwittingly sharing a closed environment (ward) with an infectious case of TB. A 2010 retrospective review of TB incidents in schools, prisons and hospital settings found that out of these three settings, most incidents occurred in hospital settings. However, the yield of positives per 100 people screened was significantly lower in hospitals setting suggesting that there may be inconsistencies with contact screening.

To help improve the management of TB exposure incidents Yorkshire and the Humber Health Protection Agency, in collaboration with NHS TB teams across the region, carried out a literature review and developed an evidence-based risk assessment tool for TB exposure incidents in hospitals. The tool is based on current best practice guidance, including NICE guidance and feedback from experts in the field of TB from the HPA and the

NHS. It is designed as an algorithm to aid decision making focusing on the factors that are associated with transmission namely: the infectiousness of the case, duration of exposure and characteristics of those exposed to the case. The tool has been piloted across Yorkshire and Humber region and feedback from this is currently being collated to help refine the tool further.

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P-7

MEASLES OUTBREAK IN A NURSERY: BEWARE THE BUSY SOCIAL LIFE OF THE MODERN BABY

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In July 2012 there was an outbreak of measles at a nursery in Wigan. Seventeen confirmed cases and 1 probable case were identified. All cases were under 16 months and nearly all under age for routine vaccination.

The index case was linked to a confirmed case in Merseyside. Initially it was thought that the index case had not attended nursery during the infectious period until a further 2 cases were identified 3 weeks later. Vaccination was offered to children over 6 months of age who had not received 2 MMR, any pyrexial children were excluded and no new children started. After further cases

the nursery was advised to close.

Social network diagrams were used to describe and manage this outbreak, including identification of at risk settings for intervention. Several cases from the nursery also attended a playgroup that ran twice a week. Vaccination was offered to children over 6 months of age who had not received 2 MMR, and the organiser opted to close the community centre running the playgroup for two weeks. Children from the playgroup attended other groups, with resultant onward transmission risk.

A number of timely actions, including, vaccination of contacts, exclusion, use of social network diagrams to understand the outbreak, and good MMR uptake in the general population ended the outbreak. The children involved had complex social calendars, the understanding of which was important for effective control measures. The closure of the nursery and playgroup may have risked wider transmission through displacement of potentially infectious children.

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P-8

SHIGELLA FLEXNERI OUTBREAK LINKED TO A TAKEAWAY IN BRADFORD- ROLE OF GENOME SEQUENCING IN LOCAL OUTBREAK MANAGEMENT

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Introduction: Following initial reports of 3 cases of *Shigella flexneri* linked to the same take-away in Bradford, outbreak investigations revealed further cases of the same serotype in Bradford. We describe the usefulness of PFGE and whole genome sequencing when managing this outbreak.

Method: Enhanced surveillance and further subtyping was undertaken. Review of Exceedence revealed slightly higher number of *Shigella flexneri* cases in Bradford.

Results: There were other *Shigella flexneri* cases that occurred in Bradford during the same time, initially thought to be part of this outbreak. These were subsequently known to be of a different serotype. Some of these cases had travel history, but since early results from local labs indicate only *Shigella* species, initial investigation was influenced by these background cases which were unlinked to the outbreak. Use of PFGE profiles indicated that only 6 cases were true outbreak cases, 4 of whom had links to the take-away and 2 that did not have any links. It was also noted by the national Reference Lab that there were 3 other cases elsewhere nationally that had same or very similar PFGE profiles. Whole genome sequencing was used to

help understand the epidemiology of *Shigella flexneri* locally.

Conclusion: Recent advances in genome sequencing offer new opportunities in managing local outbreaks. From a local perspective, such techniques can provide useful insights in outbreak control and directing use of resources for epidemiological investigation. More awareness about the practical applications of these newer methods at local level will help enhance and focus outbreak investigations.

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P-9

WHEN MEASLES MEETS THE WAKEFIELD COHORTS: MANAGING A SECONDARY SCHOOL OUTBREAK -A TRIUMPH OF PARTNERSHIP AND PROFESSIONALISM OVER THE BARRIERS OF TRANSITION

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In November 2012 a measles outbreak occurred in a large Bolton secondary school. 21 confirmed and 2 probable cases were identified, aged 11 to 15, the majority were unimmunised for measles.

Despite control measures, including a school-based immunisation session, new cases from local feeder primary schools were soon identified, indicating significant onward transmission, usually via households.

An innovative pro-active approach to prevent further cases in other secondary schools was agreed by the outbreak control team, whereby all nearby secondary schools (n=9) were targeted for school-based immunisation sessions, regardless of whether they had measles cases or not. A prioritisation framework was used, with priority given to schools with highest numbers of fully susceptible children (0 MMRs).

One immunisation session per setting was arranged. A total of 802 Children were given MMR during these sessions. Measles notifications from Bolton reduced dramatically in the following weeks, though it is not possible to directly link this decline to the intervention.

This significant undertaking was possible thanks to: the existence of a dedicated immunisation team and a school nursing team, both with extensive experience of running school-based clinics, strong health-professional networks and relationships, a sense of 'pulling together' of will and resources from different professional groups, a thriving 'Healthy Schools' e-network with its linked social media (twitter), and the support of the local media.

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P-10**CHALLENGES OF LARGE SCALE TB SCREENING IN A FAITH BASED BOARDING SCHOOL**

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Introduction: Following identification of an infectious smear positive pulmonary TB case in a faith based boarding school in Bradford, a large scale screening exercise involving over 500 people was undertaken for the entire school. We describe the incident and the challenges of organising such a large screening exercise in a resource constrained setting.

Method: As there was evidence of transmission between the index case and close contacts, using the stone-in-the-pond approach, a decision was taken to screen the whole school involving over 500 staff and students. Due to high numbers and time pressures due to school holidays, a private lab was commissioned to undertake IGRA testing.

Results: Following screening, 8 cases of active TB and over 60 cases of latent TB were identified. These cases were spread across different year groups. The screening day was efficient and ran smoothly due to excellent communication and co-operation between all stakeholders. However, the large number of

potential contacts, tight timescales and some administrative errors complicated the investigation.

Conclusion: Students in the school are from high-risk populations with families living in high TB prevalence areas. Although the school suggested that mixing between students in different years is unlikely, results suggest that either there were several small clusters uncovered during this investigation or that more mixing between students occurs than previously thought. Several lessons were learnt when managing this incident. Excellent multi-agency working and cultural sensitivity are critical during such complex investigations in faith based settings.

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Surveillance: Seeing the Wood for the Trees

P-11

IMPROVING THE PUBLIC HEALTH RESPONSE TO CHEMICAL INCIDENTS: AN EVALUATION OF THE YORKSHIRE AMBULANCE HAZMED SERVICE

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Background: The HAZMED service was developed by Yorkshire Ambulance Service (YAS) and West Yorkshire Health Protection Unit (HPU) in 2005 to improve management of chemical incidents. The remit of the team is to improve the emergency response to casualties at the scene, to expedite the public health response and to increase intelligence through better surveillance.

The service expanded in 2008 to include the whole of Yorkshire and The Humber but had not recently been evaluated. An evaluation was conducted to assess whether the service was achieving its objectives.

Methods: Data from HAZMED report forms was extracted from the database and analysed according to the type of incident attended and public health outcomes such as adverse health effects, fatalities and vulnerable people affected.

More detailed information was obtained via questionnaires sent to key stakeholders including HAZMED advisors, Fire Service Hazardous Material and Environmental Protection Officers (HMEPOs),

Consultants in Communicable Disease Control (CsCDC), Consultants in Emergency Medicine and HPA Environmental Public Health Scientists.

Results: The results demonstrate HAZMED has improved the surveillance, reporting and public health management of incidents in the region. Feedback from stakeholders was positive, although awareness of the team was lower outside West Yorkshire. Key areas for improvement included training and communication between agencies.

Conclusions: HAZMED is a valued resource that has improved the public health response to chemical incidents in Yorkshire and The Humber. The report makes recommendations for building on the strengths of the service through more joint training and developing relationships with partners.

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P-12

EPIDEMIOLOGY OF TUBERCULOSIS IN CHILDREN IN THE YORKSHIRE AND HUMBER REGION

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Background: Yorkshire and the Humber has the second highest regional TB incidence

rate in UK outside London, with increasing TB diagnoses in children. Children aged ≤ 14 years make up an increasing proportion of TB cases in the region; 9% of TB cases diagnosed in 2011, compared to UK average of 5%. TB incidence in children ≤ 14 years in the region was 6.8/ 100,000 in 2011.

The aim of this audit is to describe the incidence and patterns of transmission of TB in children in our region and to identify patterns and trends to inform prevention and control strategies.

Methods: Data from the national Enhanced TB Surveillance (ETS) database will be extracted for incident cases of TB in children aged ≤ 14 years diagnosed between 2001 and 2011 (10 years). TB incidence in children will be described by age, gender, ethnicity, place of birth (UK or non - UK), area of residence, socioeconomic status and family history of TB.

Data will also be analysed according to variables of interest including BCG vaccination history, site of disease, contact with a TB case, time from onset to diagnosis, treatment completion within 12 months and final treatment outcome.

We are interested in understanding which populations in the region are at increased risk of childhood TB and to identify specific opportunities for preventing TB transmission to children in the region.

Conclusion: The findings from this investigation will be used to make recommendations for TB service provision and prevention priorities in the region.

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P-13

ANTIMICROBIAL PRESCRIBING IN THE COMMUNITY, A REPEATED, CROSS-SECTIONAL STUDY

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Introduction: The HPSC uses purchased IMS Health sales data for the surveillance of outpatient antibiotic use in Ireland, which has been deemed unsuitable by the Antibiotic Consumption Surveillance Working Group recommendations for SARI in 2003. This study aims to demonstrate the benefits of outpatient antimicrobial consumption surveillance.

Methods: Repeated, cross-sectional study comparing point-prevalent antimicrobial prescription data using a novel antimicrobial consumption surveillance form within four community pharmacies in one geographical region of a low prescribing county (16-21 DID) in Ireland.

Results: Data for 257 antimicrobial prescriptions were recorded in week 12, 2010; and 248 for week 13, 2011. In 2010, local penicillin use was similar to national level s, however was 10% lower in 2011. Narrow-spectrum penicillin use was lower than the national level, favouring higher levels of broad-spectrum penicillins. Less macrolides and tetracyclines were observed locally with higher usage of sulfonamides/ trimethoprim and 'other antibiotic' classes. Local cephalosporin use was over double the national level at 16% in 2010 and 15.5% in

2011, compared to 6% and 5.3% respectively. For every narrow-spectrum antibiotic dispensed in the community, 10.3 broad-spectrum antibiotics were prescribed in 2010, which increased to 10.8 in 2011. Public patient antimicrobial usage was high, representing 38.1% of the Irish population, but resulting in 64% of prescriptions in 2010 and 55% in 2011.

Conclusions: This study demonstrates the benefits of outpatient antimicrobial consumption surveillance. With deviations from national levels locally, areas needing intervention can be detected and local prescribers can be given feed-back on trends observed.

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P-14

SURVEILLANCE OF INFLUENZA IMMUNISATION IN WALES: VARIATION IN AGE-SPECIFIC UPTAKE RATES IN CLINICAL RISK GROUPS

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Introduction: Immunisation against seasonal influenza is freely available for those aged 65y and older; and those aged 6m to 64y who are clinically at risk. An uptake target of 75% exists in Wales for both groups, which has not been achieved to date.

Aims: To investigate how uptake varied according to age and clinical risk group for the 2012/13 seasonal

influenza campaign in Wales.

Methods: Immunisation data was automatically extracted directly from general practice using the Audit+ Data Quality System and Read codes specified by PRIMIS+. Data was provided by 83.7% (n=396) of practices in Wales.

Results: Uptake of influenza immunisation in contributing practices was 67.4% for those aged 65y and older, however uptake within this group varied by age: 62.9% in 65-75 year olds, 73.9% in 75-84 year olds and 70.1% in those aged 85y and older.

In patients aged 6m to 64y at risk, overall uptake was 49.6%, but ranged from 39.2% in chronic liver disease patients to 65.1% in diabetics.

Immunisation uptake generally increased with age in patients at clinical risk, being lowest in 6-23 month olds (18.8%) and highest in those aged 75-84y (79.5%). Uptake in patients at clinical risk who were 65y and older exceeded 75%. Patients aged 75-84 years with immunosuppression were most likely to be immunised (81.8%).

Conclusions: Despite the uptake target of 75% not being achieved overall, this analysis shows that uptake in some of the most vulnerable patients, who are elderly and at clinical risk, is reassuringly high and exceeds the target.

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P-15**EPIDEMIOLOGICAL CHARACTERISTICS OF HETEROSEXUAL CASES IN AN ONGOING SYPHILIS EPIDEMIC IN WALES**

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In the late 1990s, cases of infectious syphilis started to increase in north Wales in men reporting sex with men (MSM). In 2002, an increase was also observed in south Wales following an outbreak in a network of MSM in a sauna. Consequently, an enhanced surveillance scheme was implemented in Wales, and these data have since been collected and analysed. Between 2002 and 2011, 676 cases were reported; 72 % (n=487) were in MSM, 17 % (n=114) were in heterosexual men and 11 % (n=71) were in heterosexual women. Over the 10 year period, the number of recorded heterosexual cases remained relatively level, peaking in 2006 and 2007 in females and males, respectively. The majority of heterosexual men (78 %) were UK-born, and 55 % were thought to have acquired their infection in Wales. The majority of heterosexual men (66 %) were diagnosed as primary or secondary syphilis, as was also the case for MSM (73 %). In heterosexual women, however, 41 % of cases were not detected until the early latent stage and of these a third was detected via antenatal screening, highlighting the importance of this programme. Only 59 % of women presenting during early latent syphilis were born in the UK, whereas

92 % of those presenting during primary or secondary syphilis were UK-born. A greater understanding of the epidemiology of syphilis in heterosexual individuals will enable us to deliver more effective, targeted public health interventions.

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P-16**SOURCE ATTRIBUTION OF SALMONELLA ENTERICA IN IRELAND USING THE MICROBIAL SUBTYPING METHOD**

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The consumption of contaminated food from food animals is the primary cause of salmonellosis. The reduction of *Salmonella* in various farm animals has been the target of public health interventions in Ireland and other countries. Source attribution is a useful tool in determining the relative contribution of particular food animals to human infections and evaluating efficiency of targeted control measures.

From 2002-09 3529 non-enteric *Salmonella* isolates from humans were referred to the National Salmonella, Shigella & Listeria Reference Laboratory (NSSLRL) for typing. In the same period 2426

isolates from food animals (poultry = 1332, swine = 844, bovine = 250) were typed in the Central Veterinary Research Laboratory (CVRL).

The microbial subtyping method using the European Food Safety Authority (EFSA) Source Attribution Modelling software was used. Data was divided into 4-year blocks, i.e. 2002-05 and 2006-09 and the subtype properties were serotype and phage type (Typhimurium and Enteritidis only). Isolates from patients with recent foreign travel were removed and just 1 isolate per point source outbreak was included.

Twenty-five percent of human isolates had a history of recent foreign travel. *S. Enteritidis* (n = 1229) was the most common serotype and 36.8% of these were associated with foreign travel while *S. Typhimurium* (n = 891) was more commonly associated with domestically acquired infection (14% foreign travel). Poultry and pork accounted for the majority of domestically acquired infections.

Work is ongoing on dividing poultry into broilers, layers, ducks and turkey and adding other food sources.

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P-17

ENHANCED SURVEILLANCE FOR TOXOPLASMOSIS IN ENGLAND AND WALES, 2008-2011

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A recent report by ACMSF on *Toxoplasma gondii* suggests that more accurate figures on the burden of disease and the risk factors for infection in the UK population are needed to inform future risk management strategies. The HPA and the Public Health Wales Toxoplasma Reference Unit (TRU) are currently undertaking a pilot study to investigate risk factors for toxoplasmosis in the UK. This paper presents preliminary data from an enhanced surveillance scheme for toxoplasmosis established in 2008, designed to better understand the burden of disease in England and Wales.

Between 2008 and 2011, 1513 cases of toxoplasmosis were reported, with an average of 378 cases each year. The majority of cases were aged between 25 and 44 years (55.2%), and 53.3% were female.

There were 917 (60.6%) immunocompetent (non-pregnant) cases, the majority presenting with lymphadenopathy; systemic or ocular symptoms were also common. There were 311 (20.6%) immunosuppressed (non-pregnant) cases, with central nervous system and systemic symptoms most frequent. There were 158 pregnant (10.4%) and 29 (1.9%) congenital cases. Of the pregnant cases, 121 were asymptomatic (probably detected during screening), whilst 24 suffered a premature delivery or stillbirth.

The enhanced surveillance system has led to an improvement in the detection of toxoplasma in England and Wales. However, numbers are still likely to be an under-estimate, with a bias towards the more severe infections. Defining the overall burden of infection in the UK will allow advice on minimising exposure and other prevention measures to be better targeted.

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P-18

INNOVATIVE USES OF AN ONLINE SURVEY TOOL

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Introduction: Online survey tools have the capacity for uses other than surveys. Through innovative use of these tools, Cheshire & Merseyside Health Protection Unit have created 2 systems that have enhanced surveillance and reduced workload within the unit.

Methods: Two online systems were created.

1. On-call staff submit returns for their period on call through a secure website.

2. Rather than the community nurses reporting daily updates for homes that they were managing without input to the Unit, they were encouraged to submit a simple but full report once the outbreak was over through a secure website.

Results:

1. The first system not only allowed a secure and timely method of transferring information but it also allowed the Unit to collect information relating to frequency of calls which directly related to workload issues within the Unit. Finally, through the collection of direct notes from on-call staff this has improved governance around handover.

2. The second system produced a standard data collection method that has greatly enhanced our knowledge of the care home outbreaks.

Both systems have;

- improved timeliness of reporting,
- allowed for prompt feedback from the Unit to the partners,
- improved data completeness,
- reduced workload both within the Unit and for external partners.

Conclusions: These innovative uses have greatly enhanced knowledge through standard collection of rich datasets and reduced workload both within the Unit and for external partners and stakeholders. It is envisaged that promotion of these systems will encourage other innovative uses of online survey tools.

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P-19

LONGITUDINAL STUDY OF ROLE OF NURSING HOMES IN THE DISSEMINATION OF METICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (MRSA), ESBL-PRODUCING ENTEROBACTERIACEAE (ESBL-PE), VANCOMYCIN RESISTANT ENTEROCOCCI (VRE) AND CARBAPENEMASE PRODUCING ENTEROBACTERIACEAE (CPE)

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Objectives:Antimicrobial resistance is a major public health problem. Nursing homes residence is associated with colonisation with antimicrobial resistant organisms (AMRO) however the dynamics of AMRO colonisation over time are not well described.

Method: Following ethical approval, residents of a nursing home (NH) were recruited. Information on demographics, dependency level, hospitalisation and antimicrobial prescribing were obtained. Rectal and nasal swabs were examined at 0 and 3 months for ESBL-PE, CPE, MRSA and VRE by culture on chromogenic agars with confirmation by conventional means. The *E. coli* O25b:ST131 clonal group was detected by PCR. PFGE was performed using *Xba*I.

Results: Fifty one of 88 residents in

4 care areas agreed to participate. ESBL-*E. coli* were detected on one occasion in 25/51 (49%) residents tested (20 at baseline and 5 after 3 months). At 3 months, ESBL-*K. pneumoniae* was detected in 2 patients one of whom also had ESBL-*E. coli*. MRSA was detected on one occasion in 12 (23.5%) of the residents (8 at baseline and 4 after 3 months). Univariate analysis showed a significant association between care area and MRSA/ESBL colonisation at the start of the study, but only with ESBL at three months. Higher dependency was associated with ESBL colonisation. All ESBL-*E. coli* isolates were *E. coli* O25b:ST131. The 2 ESBL-*K. pneumoniae* isolates were indistinguishable by PFGE. VRE and CPE were not detected.

Conclusion:ESBL-*E. coli* O25b:ST131 and MRSA colonisation were common at baseline and at 3 months. Data analysis suggests dependency is an important risk factor. ESBL-*K. pneumoniae* was not detected at baseline but emerged in 2 residents at 3 months.

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ONE IN TWO MYCOBACTERIUM BOVIS CASES RESISTANT TO ISONIAZID: DRUG RESISTANCE IN HUMAN M. BOVIS TUBERCULOSIS INFECTION IN THE SOUTH EAST OF IRELAND, 1999 TO 2010

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Aims: To describe the epidemiology of human *Mycobacterium bovis* cases in the South East of Ireland from 1999 to 2010.

Methods: Data from enhanced surveillance forms on each case of *Mycobacterium bovis* TB was analysed in MS Excel. Timeline data extracted from the Regional laboratory systems were added to the analysis.

Results: In the South East of Ireland ten cases of human tuberculosis due to *Mycobacterium bovis* were notified over the twelve year period between 1999 and 2010. This represents 3.5% of all culture confirmed *Mycobacterium tuberculosis* complex cases in the South East for that period. Over the twelve years, five (50%) of the *Mycobacterium bovis* cases had resistance to one or more first line anti-tuberculosis drugs, including two cases with multi-drug resistance. The multi-drug resistant cases had evidence that supported acquired resistance. The three cases with monoresistance to isoniazid were defined as having primary resistance. Eight patients with *Mycobacterium bovis* disease had a pulmonary component, and seven of these had acid fast bacilli seen on microscopy (five on sputum and two on bronchial washings).

Conclusions: *Mycobacterium bovis* continues to cause human disease and the high proportion of isolates with resistance to anti-tuberculosis drugs raises issues as

to the most appropriate treatment and management of cases, in particular highlighting the need for full information on drug sensitivities before step down of treatment.

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PREVALENCE AND ASSOCIATED RISK FACTORS FOR SEXUALLY TRANSMITTED INFECTIONS AT CHILDBIRTH, IRELAND, 2005-2010

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Background: Sexually transmitted infections (STI) have been increasing across Europe and have resulted in increasing rates among women of childbearing age.

Methods: A retrospective cohort study was performed to derive population-based rates of STIs reported during hospitalisation for delivery between 2005 and 2010 in Ireland. ICD-10-AM codes from hospital discharge records were used to identify STI cases. Due to small numbers, unadjusted relative risks (RR) and corresponding 95% confidence intervals (CI) stratified by age were computed to assess the strength of association between maternal risk factors and STI diagnosis.

Results: 415 of 403,642 childbirth hospitalisations included a diagnosis for a STI. Venereal warts were the

commonest reported infection (62.4 per 100,000), followed by syphilis (24.3 per 100,000) and anogenital herpesviral infection (13.4 per 10,000). Women aged <25 years were nearly four times as likely (RR 3.90; 95% CI 3.21-4.74) to have a STI diagnosis at delivery than women aged >25 years. When stratified by age, relative to married women, single women <25 years of age had a 2-fold risk of having a STI, whereas single women >25 years of age had 3-fold risk. Over the six-year period, annual syphilis rates ranged from 13.8 to 32.9 per 100,000 maternities. The stillbirth rate was substantially higher in women diagnosed with syphilis.

Conclusions: Demographic patterns in STI risk observed from hospital discharge charts were in line with international STI surveillance. The high annual rates of syphilis observed within this well defined, universally screened cohort suggest that syphilis rates are underreported in the general population.

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THE EPIDEMIOLOGY OF CANDIDAEMIA IN NORTHERN IRELAND DURING 2001-2011

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Candidaemia is associated with significant mortality and morbidity. Northern Ireland (NI), rates are higher than those in England and Wales. The aim of this study was to improve our understanding of candidaemia in NI by describing the epidemiology of infections, analysing trends in antifungal resistance and investigating *Candida* diagnostic methods.

Candida isolates from sterile sites, during 2002-2011, were extracted from a regional surveillance database and validated against individual laboratory records. The dataset contained basic demographic information, including patient location at the time of testing. In addition, laboratories supplied antifungal-susceptibility data (2006-2011) and completed a questionnaire about their diagnostic methods.

There has been a general increase number of *Candida* (IRR1.04 95%CI 1.004-1.070 P≤0.02). The most prevalent species is *C. albicans* (53.3% of 547 cases). Infection rates are higher in the older (75+), male population (40 per 100,000 population). Most were hospital inpatients (90.9%). Diagnostic methods were consistent across NI. Preliminary analysis indicated resistance was mainly in non-*albicans* species, particularly to fluconazole and voriconazole (up to 46 % and 33% respectively of *C. glabrata* species tested). No resistance was detected in *C. albicans*.

Whilst there has been an increase in candidaemia the epidemiology of infections reported in NI is similar

to the rest of the UK¹. A comparison of diagnostic methods in England is underway. In addition, a review of candidaemia patients in NI is being undertaken to facilitate the generation of hypotheses regarding the higher NI candidaemia rate.

¹ Health Protection Agency (HPA) 2011. Laboratory reports of candidaemia, England, Wales and Northern Ireland. <http://www.hpa.org.uk/hpr/archives/2011/hpr3711.pdf>

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P-23

BEYOND POST AND FAX: WEB BASED DATA COLLECTION FOR ROUTINE SURVEILLANCE

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Greater Manchester Health Protection Unit currently uses postal questionnaires for cases of *Salmonella*, *Cryptosporidium* and *Giardia*. Cases of VTEC, enteric fever, Legionnaires' disease and *Shigella* are followed up by environmental health officers (EHOs), completing paper questionnaires and faxing these back.

To aid rapid secure transmission of information, increase response rates, reduce postal costs and reduce paper, we are investigating the feasibility of using HPA's online survey tool, Select Survey, as a data collection option as an alternative

for both members of the public and EHOs.

The webpage address and a QR code will be included in letters for individual cases to provide the option of online completion.

EHOs will be given the option of paper based or online questionnaire completion.

This will be piloted then rolled out across Greater Manchester. We will describe the feasibility, acceptability and uptake of the web based option by individual cases and by EHOs. We will report lessons learnt during this project.

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MEASLES-RELATED HOSPITALISATIONS DURING AN OUTBREAK IN THE NORTH EAST OF ENGLAND

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Introduction: This study aims to describe the clinical features of severe measles requiring hospitalisation during an outbreak in the North East of England.

Methods: Patients were included if they had been admitted to hospital between 1 September 2012 and 28 February 2013 with measles. Basic demographic information was obtained retrospectively from a surveillance database. Lead clinicians were contacted via secure

email and/or telephone to obtain further clinical information. A pro forma was used to expedite the data collection process. The data was entered and analysed using Microsoft Excel.

Results: Forty-seven patients were identified, with a median age of 14 (interquartile range 1-20). The male to female ratio was 1.14. Measles was confirmed in 35/47 (74.5%). Only 10/47 (21.3%) of patients had been vaccinated, and 6/10 (60.0%) vaccinations were post-exposure. Data on hospital admission, stay, and discharge was incomplete at the time of submission of this abstract. Preliminary findings suggest that a number of patients experienced complications, including convulsions, hepatitis, myocarditis, and pneumonia. No patients died during the study period. The overall case-hospitalisation rate was 19.2% (47/245).

Conclusions: The results from this study will add to the literature, in light of the changing epidemiology of measles infection in the United Kingdom. We hope to identify the types of complications patients are experiencing and whether there are any differences between age groups. We also hope to describe the burden on health services resulting from the outbreak. This information will be taken into account when making recommendations for further measles vaccination campaigns.

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INTERNATIONAL EPIDEMIC INTELLIGENCE: NEW AND EMERGING HAZARDS SURVEILLANCE IN SCOTLAND

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Background: With over 300 new diseases emerging in the past 70 years, and increased international travel and trade Health Protection Scotland began a programme to identify and assess emerging hazards as risks to Scottish Public Health.

Objectives: To 1) survey sources for potential hazards 2) identify realistic threats to Scotland and 2) aid organisational resilience around such threats.

Method: Taking an all-hazard approach a range of experts from niche areas of infectious disease and environmental health surveillance and response were asked to survey media, surveillance and publications and to report any potential risks.

Results: For a 1 month period (April 2012) 24 incidents were reported of which 7 were due to single cases of H5N1 abroad. The remaining incidents were related to infectious diseases (N=14), chemical contaminants (N=1), failure of testing kits (N=1), vaccine-related outcomes (N=1) and one due to recovery from clinical rabies. Two incidents, Schmallenberg virus in livestock and sodium nitrate mislabelling, had realistic potential

to affect the international public health through the food chain, while malaria in the Bahamas had the potential to affect blood products. A major weakness of the model was that risk assessment was not being applied in the same way by each data supplier.

Conclusions: Risk assessment is a term often used in clinical and health protection practice but it is clear we may understand it differently. As a result of this pilot guidance on risk assessment is to be developed to encompass an all-hazard approach.

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EPIDEMIOLOGICAL CHARACTERISTICS OF THE 2012 AUTUMN PEAK OF CRYPTOSPORIDIUM

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Cryptosporidium is the leading protozoan cause of human gastrointestinal infection in the UK. *Cryptosporidium* shows a marked seasonal trend with peaks recorded in spring and late summer/early autumn associated with *Cryptosporidium parvum* and *Cryptosporidium hominis*, respectively. Preliminary analysis suggests that 492 cases were reported in Wales in 2012, the highest annual number of cryptosporidium

cases in Wales since 1990. The autumn peak (specimen weeks 32-46) recorded the highest incidence of lab-confirmed cryptosporidium cases since 2002, with 294 cases reported. This study investigated the epidemiological characteristics of the 2012 autumn peak for specimen weeks 32-46, using data from the Enhanced Cryptosporidium Surveillance questionnaires and CoSurv laboratory data.

The greatest number of cases were recorded in September (n=122). The duration of the peak spanned longer than usual autumn peaks. Of the 147 enhanced surveillance questionnaires received, 100 cases were infected with *C. hominis* and the remaining cases infected with other or multiple strain types e.g. *C. parvum* and *C. meleagridis*. Outbreaks do not appear to account for the rise in cryptosporidium cases. Males and females were equally infected. The modal age group was 5-14 years. Previously reported risk factors for infection such as animal contact and eating out were reported in over 60% of cases.

Investigating these case characteristics should provide a greater understanding about the epidemiology of cryptosporidiosis, monitor changes in genotypes, enable case-case comparisons and explore potential risk factors in more detail for use in preventative measures.

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HEPATITIS E VIRUS ENHANCED SURVEILLANCE IN WALES: 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 source of infection in these cases remains unknown. Public Health Wales is collaborating with the Health Protection Agency 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, 39 questionnaires were received on lab-confirmed hepatitis E cases of which 29 were UK-acquired cases and 10 were travel-related cases. Of the 29 UK-acquired cases, 72% were male, 90% of cases were aged 45 years and older and 45% of cases lived close to an estuary or coastal area. Findings from cases in Wales indicate that 72% of cases handled raw or uncooked meat, 41% of cases owned a pet and 35% 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 epidemiology of non-

travel associated hepatitis E cases which is currently limited. This is particularly important given that data on human cases may be underestimated as 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.

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Bloodborne Viruses and Sexually Transmitted Infections: Home and Away

P-28

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

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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 new-borns at risk of perinatal transmission, an all Wales Neonatal Hepatitis B Database was developed. This study summarises uptake and timeliness of neonatal hepatitis B vaccination for children born during 2011 and resident in Wales.

Seventy-one babies were born to positive mothers in 2011, of which seven were lost to follow up (moved away). Median maternal age was 30 years and did not vary significantly by region. The most commonly

recorded ethnicity of infected mothers was Chinese. HBIG was indicated for 14/64 of the neonates and was delivered to 100% of these babies, 93% receiving it on the day of birth or the next day. All babies were immunised with the first, second and third dose of hepatitis B vaccination. All babies received dose 1 on their day of birth or the next day, 50% (32/64) of babies received dose 2 and 67% (43/64) babies received dose 3 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.

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EXPANSION OF HIV SCREENING VIA AN ON-LINE ORDERING AND HOME SELF-SAMPLING SERVICE USING DRY BLOOD SPOT TESTING (RUClear? PILOTS 2011-2012)

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Background: The burden of disease relating to undiagnosed HIV infection is significant UK-wide. Manchester and Salford have the second and fourth highest prevalence of HIV infection outside London respectively. British HIV Association (BHIVA) guidance recommends population screening in high prevalence areas, expanding outside of traditional antenatal/GUM settings. A single early diagnosed case of HIV could potentially save £1.2m via prevention of onward transmission.

Aims: To assess feasibility, acceptability, sustainability, clinical and cost-effectiveness of introducing an on-line service allowing Greater Manchester residents to request HIV dry blood spot (DBS) self-sampling-at-home kits, facilitating early diagnosis of HIV infection in high prevalence areas with timely specialist referral.

Methods: Use an existing, successful on-line chlamydia testing service (RUClear?) to provide an on-line HIV self-sampling testing kit requesting service for Greater Manchester residents.

Key findings: The offer of HIV screening via home self-sampling using DBS test kits ordered on-line was demonstrated as feasible, acceptable, clinically and cost-effective and sustainable. Approximately 3000 tests were requested over an 18-month period. 7 new HIV infections detected, 4 at an early stage of infection.

Population (positivity 1.43/1000 tests) and high risk screening methods (positivity 4.16/1000 tests) were shown as cost-effective against American guidelines (>1 new positive test/1000 tests).

Conclusions: These results support the case for investment in HIV population screening in high prevalence areas as a cost-effective service and as recommended by several national bodies. Commissioners should consider use of on-line ordering of self-sampling, HIV DBS testing kits as a method of successfully increasing HIV screening and detection of early infection.

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Vaccine Preventable Diseases: Injecting some common sense into disease prevention

P-30

KNOWING WHO IS INFECTIOUS AND WHO IS PROTECTED: A CASE REPORT OF A HEALTHCARE WORKER WITH MEASLES

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Background: Since September 2012, there has been an outbreak of measles in the North East of England. There has been poor recognition of measles in a number of healthcare settings and this, together with the lack of certainty about healthcare workers' immune status, has led to several instances of likely transmission in healthcare settings and considerable disruption to healthcare services. We describe a case involving a measles-infected healthcare worker.

Case details: A 33 year old general practitioner (GP) developed symptoms of measles infection approximately nine days after visiting a patient at home. He thought the patient, who was unvaccinated, had scarlet fever. The GP worked four half-day sessions over three days at his regular practice while infectious. Twenty-two clinical contacts were identified. Two immunosuppressed individuals and a three-week old child received immunoglobulin. Three

members of staff, including a nurse and a doctor, received prophylactic vaccination and were temporarily excluded from their clinical duties. The GP also worked two sessions in two different urgent care clinics while infectious. Management of staff and patient contacts in these clinics was handled by the acute trust.

Conclusions: This case illustrates some of the ramifications of a missed measles diagnosis. Infection control measures are essential in preventing the exposure of vulnerable individuals to measles, including healthcare workers. Further efforts are needed in educating healthcare workers and the public about measles and its infectivity. Employers should do more to ensure that their staff are immune. Initiatives are needed to improve vaccination coverage in the wider community.

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IMMUNISING A CAPTIVE AUDIENCE IN THE NORTH EAST OF ENGLAND - HOW ARE WE DOING?

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Prisoners are a diverse population and differ by age, gender, ethnicity, country of origin, and experience of health and disease. Due to previous inequalities in access and opportunity many prisoners have missed out on routine services

including immunisations, reinforcing health inequalities in the offender populations. Primary prevention is an important public health principle and immunisation is a cornerstone of good preventative practice.

An audit tool was developed by a multiagency team involved in immunisations and prison health care in the North East Region. The audit aimed to measure current practice and provides a baseline. It looked at policies/procedures and facilities in each prison and reviewed a selection of prisoner records from each site looking at immunisation status and standard of record keeping.

The audit was undertaken in nine prison/secure units during September and October 2012. It identified many areas of good practise, particularly around facilities and procedures. However, measures to appropriately assess each individual's immunisation history and provide a subsequent programme of planned vaccinations required significant improvement.

With the exception of hepatitis B vaccinations, most prisoners had limited vaccination histories and no record of vaccinations offered. National and local policies state that individuals with no vaccination history should be assumed to be unimmunised, and a comprehensive, tailored programme of vaccinations offered.

The main recommendations were:

Ensure improved screening and record keeping on or shortly after reception.

Ensure a tailored schedule is planned for all prisoners, and that it is appropriately recorded.

Develop a simple audit tool to review compliance with the recommendations above.

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INTRODUCTION OF A LIVE ATTENUATED INFLUENZA VACCINE IN NORTHERN IRELAND: A SURVEY OF PRACTICE STAFF

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Introduction: Fluenz was used in the Northern Ireland 2012-2013 flu vaccination programme as the vaccine of choice for individuals in at-risk groups aged between 2 and under 18 years. An online survey was used to obtain feedback from practice staff on Fluenz, to assess how staff found Fluenz and how they perceived patients' reactions to it.

Methods: An online survey was developed using the SurveyMonkey website, with 12 objective, non-leading questions. A link to the survey was sent via email to all 353 general practices in Northern Ireland. The survey was open to all staff involved in administering flu vaccine, from 7th-30th January 2013. There were 193 responses.

Results: 71.9% of respondents (n=138) preferred Fluenz to injected vaccine. 86.5% felt patients preferred Fluenz. Some teenagers

preferred injected vaccine. There were parental concerns about Fluenz being 'live,' side effects and effectiveness.

68.6% of respondents experienced no difficulties and 53.8% found Fluenz easier to administer than injected vaccine. 72.1% felt they had enough information. There were issues with supply, administration, determining eligibility and communication.

Greater proportions of those who attended training preferred Fluenz, reported no difficulties and had enough information compared to those who did not attend.

Conclusions: In the UK, annual Fluenz vaccination has been recommended for all children and adolescents aged from 2 to under 17 years. This survey highlights issues associated with Fluenz. Clear information is needed for professionals and the public. Training should include information on administration, eligibility and contraindications. Practices should be encouraged not to over-order supplies.

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EXPLORING THE EPIDEMIOLOGY OF MEASLES IN YORKSHIRE AND THE HUMBER: IS SOCIO-ECONOMIC DEPRIVATION A RISK FACTOR?

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Introduction: Although extensive immunisation literature has been published, none address how factors affect the epidemiology of measles at a local level. This study aims to explore the epidemiology of measles and MMR vaccination in Yorkshire and the Humber (Y&H). This study also specifically examines deprivation and its association with measles incidence at a local and national level.

Methods: Data was collated from Health Protection Agency case management systems in Y&H and combined with measures of deprivation and urbanisation. An ecological study design was used to test the association between deprivation and measles incidence. A negative binomial multivariate model was constructed to adjust for the potential confounders of urbanisation and area vaccination uptake.

Results: In univariate analysis a statistically significant association at a regional level is present between deprivation and measles incidence (RR 1.64 95%CI: 1.25 - 2.15, $p < 0.01$). Indicating that those in the top two deprivation quintiles have a 64% increased risk of developing

measles in Y&H. When tested in a multivariate model with vaccination and urbanisation, any association between deprivation and measles incidence becomes non significant (IRR 1.38 95%CI: 0.72 - 2.63, $p=0.34$).

Discussion: Deprivation as a risk factor for measles incidence could not be established from this research. When examined at a PCT level nationally, any association between measles incidence and deprivation can be accounted for by the effects of urbanisation and area vaccination uptake. This is the first research identified which compares the effects of area vaccination against other risk factors.

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Environmental Change and the Four Furies: Fire, Floor Freeze and ... Wee Beasties!

P-34

HEALTH EFFECTS OF FLOODING : ISSUES FOR HEALTH PROTECTION IN THE UK

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Flooding is a regular occurrence in the UK and is associated with a range of impacts on health and wellbeing. In addition to deaths from drowning, flooding may damage local infrastructure, affect access to water supplies and impact health systems, all of which have implications for human health and health protection.

The health effects of flooding can be direct or indirect. Direct health effects are those caused by immediate contact with flood water, including drowning and physical trauma. Indirect health effects are those that result as a consequence of flooding and include the impacts from damage to infrastructure and water supplies, displacement, and disruption to people's lives. Health effects can continue after flood waters recede and may persist for months or years. The HPA provides guidance on managing the health effects associated with flooding.

Statistics from the Met Office indicate that 2012 was the 2nd wettest year on record in the UK, and media reports documented 10 deaths associated with flooding. In England, poorer communities are at higher risk of coastal flooding while for river flooding, high flood risk areas tend to include higher income households.

UK climate change projections indicate that winter rainfall levels are likely to increase significantly while summer rainfall levels are likely to decrease significantly, and coastal areas are likely to be more vulnerable to climate change. Floods are complex problems that require multi-agency responses, with important implications for health protection. The health sector must be aware of the potential risks and be prepared to respond.

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THE COLD WEATHER PLAN FOR ENGLAND

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There were an estimated 24,000 excess winter deaths (EWD) in England and Wales in 2011/12. This equates to around 15 per cent more deaths in the winter period compared with the non-winter period. The Cold Weather Plan for England (CWP) is a public health plan and was first published in 2011 to help reduce EWDs. It is updated and published each winter by the Department of

Health, Health Protection Agency and UK Met Office and is a cross government plan.

The CWP recommends a series of steps to reduce the risk to health from prolonged exposure to severe cold weather by raising public awareness and triggering actions of those in contact with people most at risk.

A Cold Weather Alert service provided by the UK Met Office underpins the CWP. There are different alert levels depending on the severity of the cold event and a series of actions based on these are recommended for local health and social care organisations and professionals and community organisations. The Plan has also been supported by the 'Warm Homes Healthy People Fund' over its first two years. This fund aims to support Local Authorities in reducing deaths and poor health due to cold housing.

This poster will cover the development, publication and evaluation of the Plan. It will highlight how the Plan aims to address EWD and cold related morbidity in England through engagement with public health, health and social care professionals, government, community actors, voluntary partners and individuals.

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Hot Topics

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COMMON-SENSE INTERPRETATION AND APPLICATION OF AN INTERNATIONAL TREATY: APPLYING THE INTERNATIONAL HEALTH REGULATIONS AT POINTS OF ENTRY

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Background: As a signatory to the international Health Regulations (IHR) the UK undertook to enhance surveillance and response. As part of this commitment and in line with IHR the UK agreed to survey and designate appropriate sea and air ports under IHR.

Objectives: To apply articles 19-21 of the IHR in order to identify points of entry (sea and air ports) as Designated Points of Entry (DPsoE).

Method: Following a survey of key UK Ports against WHO criteria for DPsoE by the four UK administrations the Department of Health set up a DPoE Working Group to work through issues arising and to present a list of UK ports for designation. The Working Group analysed barriers to designation, after consultation with health protection, port operators, and the Civil Aviation Authority.

Results: After considering IHR documentation and submissions from key parties the wording of IHR was found to be a major barrier

to designation as it allowed wide interpretation of DPsoE, from one to many international points of entry in each member state. Additional problems were foreseen in utilising DPsoE during any Public Health Emergency of International Concern (PHEIC) which might arise in turn from the all-hazard definition of potential PHEICs. What would be expected from international hubs which were not DPsoE was also unclear.

Conclusions: UK port health response at international ports operates at a high standard. However, if DPsoE are not clearly defined and planned, confusion may result in early stages of any PHEIC resulting in risk to public health.

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MONITORING FOR LOW LEVEL CONTAMINATION OF WATER WITH VERO-TOXIGENIC E. COLI

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Verotoxigenic *E. coli* (VTEC) incidence rates in Ireland have increased in recent years. Water is a key transmission route for VTEC. Bacteriological monitoring of drinking water relies largely on culture-based examination of volumes of 100 ml to 1L; an

approach likely to miss low level, intermittent contamination of potential public health significance. The objective was to develop a protocol for monitoring large water volumes for VTEC. We evaluated commercial filters for capturing *Cryptosporidium*, alone and in-series with a 0.45 µm filter (Millipore), using sterile tap water spiked with *E. coli* O157:H7. Filters were subjected to direct nucleic acid extraction and extraction after broth enrichment at 37°C and 42°C. Broths were cultured on CHROMagar™ VTEC plates. VTEC was not captured to any significant degree by the *Cryptosporidium* filter but was captured by the 0.45 µm filter. VTEC was detected in direct filter extracts and enrichments using real-time PCR targeting intimin (*eae* gene). The limit of detection of the system was 10 colony-forming units (CFU)/L. Real-time PCR targeting *eae*, verotoxin (*vtx* 1 & 2) and O-antigen (O157 & O26) genes was applied to river water samples. Enrichments of filters at 42 °C led to earlier detection of VTEC by real-time PCR and improved isolation on CHROMagar™. Application of the method to large river water volumes (>10L) resulted in detection of *vtx*, *eae*, O157 and O26 genes and isolation of a *vtx* 1/2 positive *E. coli* O26. We conclude that this is a promising approach to monitor for VTEC contamination of water sources.

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PART 2A ORDERS: HOW HAVE THEY BEEN USED SINCE THEY WERE INTRODUCED?

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Introduction: New health protection regulations came into force in England in April 2010. These gave Local Authorities wider powers to deal with instances where infection or contamination may present a risk to human health. One power available to Local Authorities is a Part 2A Order to impose restrictions or requirements to protect human health. This study examined how Part 2A Orders have been used by the Health Protection teams across England between 1st April 2010 and 1st December 2012.

Methods: A select survey questionnaire was sent to the CCDCs involved in each of the 18 Part 2A Orders for this period. A 100% response rate was achieved.

Findings: Nearly all Part 2A Orders were in relation to TB and involved individuals with complex social issues. Most CCDCs (15/18) reported the Part 2A Order achieved the outcomes they had hoped for and most (14/18) felt the current system is working well or very well. Successfully enforcing a Part 2A Order proved more challenging than obtaining the Order chiefly due to issues relating to security and multiagency working. No individuals against whom a Part 2A Order was

sought received any legal advice or support.

Discussion: In general the Part 2A Order system appears to be working well. Issues which need further consideration include greater clarity about the level of security that can be used to detain an individual, raising awareness of Part 2A Orders, improving multiagency working and whether legal representation for those subject to Orders should be reviewed.

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A REGIONAL PROGRAMME OF CLOSTRIDIUM DIFFICILE SURVEILLANCE IN PRIMARY AND/OR COMMUNITY SETTINGS: PREVALENCE, RIBOTYPES AND RISK FACTORS

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To describe the epidemiology of *Clostridium difficile* infection (CDI) in primary and community care settings in NI.

An enhanced surveillance programme for CDI in community and primary care settings was introduced in April 2010. Enhanced CDI proformas have been completed for all CDI specimens taken in care homes and requested from GP surgeries. Explanatory variables included patient demographics, residence of case, prior exposure to antimicrobials and gastrointestinal drugs, previous hospitalisation and CDI ribotype.

During 2011-12 there were 1,276 cases of CDI in acute and community settings. Of these, 956 were hospital-onset and 320 were community-onset.

Of the 320 community-onset cases, 66% were females (210/320) and 91% were aged 65 years and over (291/320). Over half of the cases were living in their own home (170/320; 53%). 49% (158/320) of the cases had received antimicrobial therapy in the previous 1 to 4 weeks prior to CDI onset. 43% (139/320) had received GI therapy including proton pump inhibitors and H2 antagonists. 60% (192/320) had some form of healthcare contact prior to symptom onset. For both 'community onset-community associated' and 'community onset-hospital associated' cases the most prevalent ribotype was 078.

Whilst the incidence of CDI in acute healthcare settings in NI has decreased since January 2009, the incidence of CDI with onset of symptoms in the community setting has been increasing. This study confirms the presence of known risk factors; antimicrobials, GI therapy and previous healthcare contacts, in this population of community-onset CDI. Similar to the acute setting, ribotype 078 dominates amongst cases.

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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 Centre for Infectious Disease Surveillance and Control working on gastrointestinal infections, primarily norovirus.

Musarrat Afza

Musarrat Afza is a Consultant in Communicable Disease Control in Public Health England, West Midlands North Health Protection team. Her special interest areas include immunisation, environmental public health, travel health and public health training. She has previously worked as a hospital physician with interest in diabetes and endocrinology

Corinne Amar

Corinne Amar is currently the head of the Foodborne Pathogens Reference Services, Public Health England - London. Dr Amar trained as a molecular microbiologist and specialised in the study of gastrointestinal pathogens.

Nachi Arunachalam

Nachi Arunachalam is a Consultant in Communicable Disease Control for the South Yorkshire Team of Public Health England where he is the GI lead. He trained in Public Health in both India and the United Kingdom.

Anthony Breslin

Anthony Breslin qualified in Galway. He trained in Public Health in Scotland where he also worked as a Consultant in Communicable Disease and Environmental Health prior to taking up his current post in the North West of Ireland.

Lisa Byrne

Lisa Byrne is currently an epidemiological scientist for Public Health England with responsibilities for national surveillance of VTEC and HUS infections. Previously, Lisa worked on surveillance of infections in blood donors for six years. Lisa has an MSc in Public Health from the London School of Hygiene and Tropical Medicine.

Catherine Coyle

Catherine Coyle is a Specialty Registrar in public health medicine working and training in the Public Health Agency in Northern Ireland, across the areas of health protection, service development and screening and health improvement.

James Crick

James Crick is a Specialty Registrar in Public Health, currently on placement with the North Yorkshire and Humber Health Protection Team. Prior to beginning Public Health training he worked as a GP in Yorkshire.

Louise Cullen

Louise Cullen is a Surveillance Scientist with the Department of Public Health Medicine in the HSE West. She is a member of the Department's Management Team, and of the Regional Immunisation Committee. She has recently completed a Masters in Public Health, which involved a research study evaluating parent's attitudes to a change in their child's immunisation programme.

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.

Una Fallon

Dr. Una Fallon trained in General Practice in Ireland and completed her Public Health training in the UK. She is currently a consultant in Public Health Medicine in the Midlands, Ireland. Her interests include epidemiology, evidence-based Public Health practice and health and the environment.

Kirsty Foster

Kirsty Foster is a Consultant in health Protection working in the North East of England. She is the regional lead for sexual health and HIV.

Shaji Geevarghese

Shaji Geevarghese is an Associate Specialist in KSS PHEC . Lead areas are Prisons, Local authority & Environmental health, TB, Port health etc. Has been working in Communicable disease control for the last 12 years.

Noel Gill

Noel Gill is Head of HIV & STI Department, Nation Centre for Infectious Disease Surveillance and Control (NICIDSC), Public Health England, and Honorary Professor at the London School of Hygiene Tropical Medicine. After house officer posts in Cork and Dublin and a period working in Sierra Leone, he trained in infectious disease epidemiology with the Public Health Laboratory Service in London.

Ian Grey

Ian Gray is a Chartered Environmental Health Practitioner and Principal Policy Officer at the Chartered Institute of Environmental Health. He leads on public health and health protection. He led the project *Environmental Health 2012 – A key partner in delivering the public health agenda* which has shaped modern training and practice.

Ruth Harrell

Ruth Harrell is a Specialty Registrar in Public Health based in the West Midlands, currently working with the Field Epidemiology Service.

Leena Inamdar

Leena Inamdar is a Consultant in Health Protection at Public Health England, based in Leeds. As Lead Consultant for Bradford, a vibrant multicultural city, there is always something exciting to work on, such as food poisoning outbreaks, TB incidents and flu outbreaks and she really enjoys this aspect of her role.

Jillian Johnston

Jillian Johnston is a Specialty Registrar in the Public Health Agency, Northern Ireland with an interest in health protection.

Smita Kapadia

Smita Kapadia is a Consultant in Communicable Disease Control at the South Midlands and Hertfordshire Public Health England Centre. Following her training in Public Health in India and the UK, she worked as a Locum Consultant at HPA Colindale and Essex HPU. Smita is currently the training and immunisation lead and has an interest in control of blood borne viruses.

Cathriona Kearns

Cathriona Kearns has been an epidemiological scientist with the Public Health Agency (NI) for 5 years. She is the Northern Ireland Enhanced Tuberculosis Surveillance coordinator. Cathriona worked previously on agricultural research with the Agri-Food and Biosciences Institute (NI) and is currently in the final stage of a PhD on risks associated with pesticides.

Phillip Keel

Philip Keel is a hepatitis B research scientist in Epidemiology working for Public Health England. He has a jointly awarded MSc Veterinary Epidemiology from London School of Hygiene and Tropical Medicine/Royal Veterinary College. His interests include engaging with school children to encourage the pursuit of future careers in science.

Alex Keenan

Alex Keenan had a career as a Nuclear Physicist before a career in Public Health. He joined the HPA in 2006 and since then has been developing surveillance systems as well as promoting innovative and novel approaches to Public Health issues and research activities.

Ina Kelly

Ina Kelly qualified in medicine in 1986. She worked in Ireland, UK and Australia and completed GP training in Western Australia. She now works as a Consultant in Public Health Medicine in Cork, in health protection and also with the National Asthma Programme.

Kenneth Lamden

Kenneth Lamden is a consultant with the Cumbria and Lancashire Public Health England Centre. His interest in listeriosis stemmed from investigating several outbreaks in North West England. He Chaired the HPA Group that produced internal guidance on case management of *Listeria monocytogenes*. Dr Lamden's other interests include giardiasis and vaccine preventable diseases.

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

Virginia Murray

Virginia Murray is Head of Extreme Events and Health Protection, Public Health England. In January 2011, Virginia was appointed as Head of the new Extreme Events and Health Protection and is taking forward evidence based information and advice on flooding, heat, cold, volcanic ash, and other extreme weather and natural hazards events. The team leads on the Heatwave Plan for England and the Cold Weather Plan for England and is working on the health impacts of flooding plans.

Colin Ramsay

Dr Colin Ramsay, is a Consultant Epidemiologist at Health Protection Scotland where he has led on environmental issues since 1999. He leads a small team within HPS on environmental surveillance (Environmental Public health Tracking), incident response and guideline development and chairs the

Scottish Environmental Public Health Practice Network (SEPHNet). Colin is also the Scottish representative on a number of UK health protection groups and maintains close links with colleagues in PHE (CRCE).

Michael Ryan

Michael Ryan is Irish and is currently Adjunct Professor of International Health at University College Dublin and an International Health Consultant, having worked as Director of Global Alert and Response at the World Health Organization in Geneva for over 15 years

His background is in medicine, infectious disease and public health. A graduate of University College Galway, he undertook higher specialist in Public Health at the Communicable Diseases Surveillance Centre (PHLS/CDSC) in London. He is an EPIET alumnus.

Dr Ryan joined WHO in 1996 and led numerous field response teams in managing outbreak tackling a wide range of serious tropical infections. From 2001 he worked as Coordinator of WHO's Epidemic Response Team and the Global Outbreak Alert and Response Network (GOARN) in responding to more than 150 international outbreaks.

He was appointed Director of Alert and Response Operations in June 2004 and shortly thereafter as Director Global Alert and Response at WHO Headquarters.

Corinna Sadlier

Corinna Sadlier is a Specialist registrar in Infectious Diseases. She is currently working in St James's Hospital, Dublin. She has a special interest in disease prevention particularly the utility of vaccination. Her MD thesis which is being undertaken with Trinity College Dublin examines vaccine efficacy in HIV infected adults

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 Advisory Group, Health Protection Network.

Martin Schweiger

Martin Schweiger is a Shoemaker's son attracted into medicine by the smell of antiseptics. UCCA found a place at Leeds Medical School as term started. Six years in Bangladesh led to anger about preventable distress, disease and death and the discovery of the magic in public health. Risk identification and mitigation continue to excite my imagination.

Frances Shiely

Frances Shiely is a Lecturer in Epidemiology and Public Health at University College Cork and a Senior Lecturer in Research Methodologies at the Clinical Research Facility, Cork. Her interests are in lifestyle epidemiology and sexually transmitted diseases.

Tara Shivaki

Tara Shivaji is a Specialist trainee in Public Health in Scotland with previous experience of communicable disease control in resource limited settings. Her research interests include translating evidence into policy and measures to address health inequality.

Lelia Thornton

Lelia Thornton is a Specialist in Public Health Medicine in the Health Protection Surveillance Centre in Dublin where she is head of the hepatitis division. She is a senior clinical lecturer in Trinity College Dublin.

John Watson

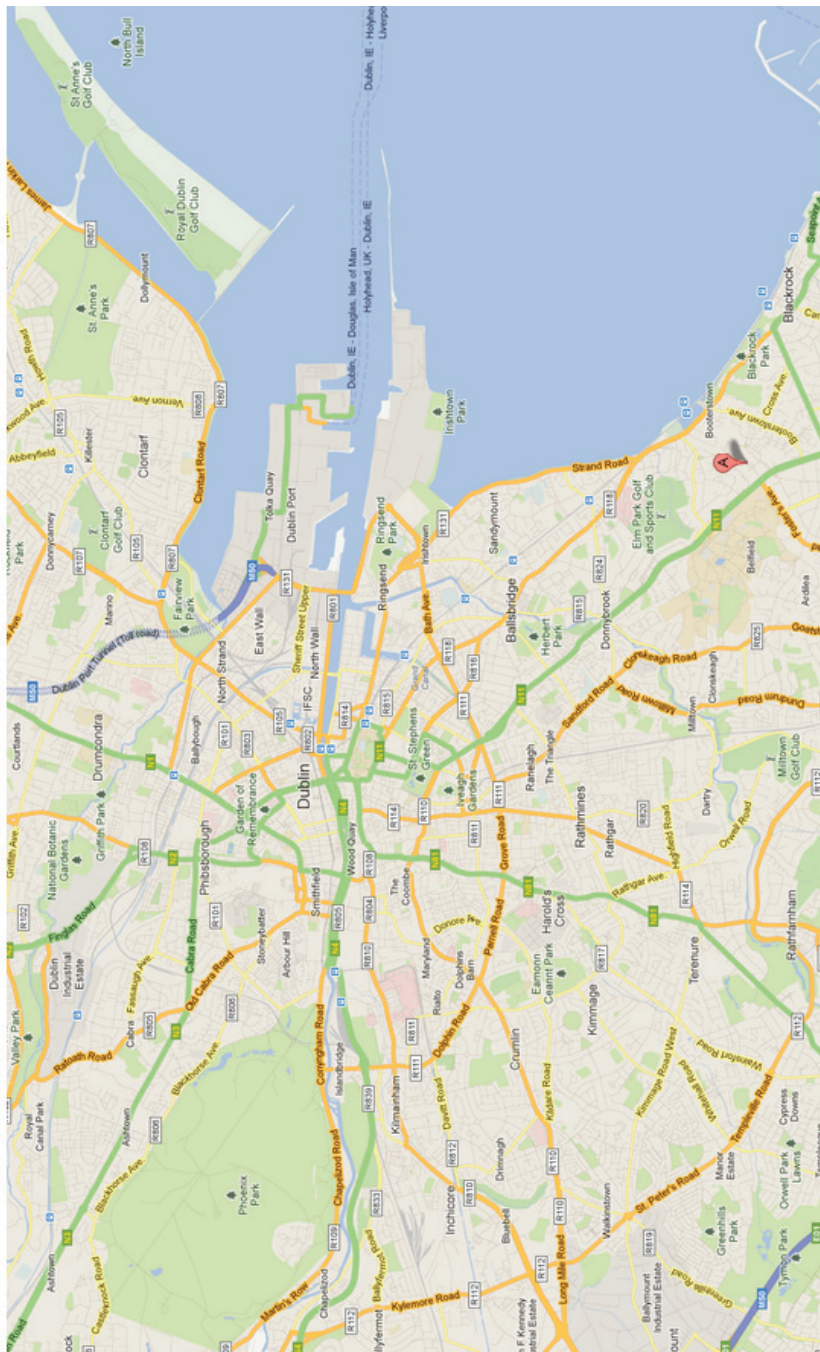
John Watson is Head of the Respiratory Diseases Department at Public Health England's Centre for Infectious Disease Surveillance and Control in London. His main interests include tuberculosis and acute respiratory infections (particularly influenza, legionnaires and SARS). His work has focussed on the surveillance, prevention and control of these diseases at the local, national and international levels as well as related research



Notes

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DUBLIN CITY MAP



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