

5 Nations Health Protection Conference

9th – 11th May 2016

Cardiff Marriott Hotel

www.5nations.org.uk

A nighttime photograph of the Cardiff city skyline, featuring the prominent red-brick Cardiff City Hall with its clock tower and the modern, glass-walled Cardiff Bay Convention Centre. The buildings are illuminated, and their lights are reflected in the calm water of the bay. The sky is a deep blue with some light clouds.

**Final Programme
&
Abstracts**

5 Nations Health Protection Conference

Contents	Page
Conference Organising Committee	1
Aims and Objectives	2
Scientific Programme	3
General Information	12
Social Events	14
Exhibitor Information	15
Oral Abstracts	16
Poster Abstracts	39
Chairs and Speakers	70
Author Index	76
Notes	81
Cardiff Map	INBC

Conference Organising Committee

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Consultant in Health Protection,
Public Health Agency for Northern Ireland

5 Nations Health Protection Conference

AIMS AND OBJECTIVES

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

The objectives are:

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

Monday 9th May	
08:00 – 17:30	Registration Open / Tea / Coffee
11:00 – 11:10	Welcome <i>Dr Meirion Evans, Public Health Wales</i>
11:10 – 11:25	Opening Speech, Chairman, Public Health Wales <i>Prof Sir Mansel Aylward</i>
11:25 – 12:15	Keynote Speaker Emerging Infections: Shifting the Paradigm from Rapid Detection and Response to Prevention at the Source <i>Professor David Heymann, Chair, Public Health England Board</i>
Session 1: Oral Presentations – Respiratory Infections	
12:15 – 13:30	<i>Chair: Ebere Okereke</i> <i>Organisers: Gavin Dabrera and Ebere Okereke</i>
12.15 – 12.30	O-1 Sharing the learning from the first documented outbreak of serious pneumococcal disease in men exposed to welding fumes at a Belfast shipyard, May 2015 <i>Lynsey Patterson^{1,2}</i> <i>¹Field Epidemiology Training Programme, Public Health England, Belfast, United Kingdom, ²Public Health Agency (Northern Ireland), Belfast, United Kingdom</i>
12.30 – 12.45	O-2 Impact of possible cases of Middle East Respiratory Syndrome coronavirus post Hajj in Edinburgh, Scotland <i>Kirsty Morrison¹</i> <i>¹NHS Lothian, Edinburgh, United Kingdom</i>
12.45 – 13.00	O-3 Avian Influenza – July 2015 Health Protection Team Response <i>Shelagh Snape¹, John Astbury¹</i> <i>¹PHE, Chorley, United Kingdom</i>

5 Nations Health Protection Conference

13.00 – 13.15	<p>O-4 Complimentary or confusing: the roles of epidemiology and MIRU-VNTR profiling in identifying and managing a challenging TB cluster <i>Ceryl Harwood¹</i> ¹Public Health England Yorkshire and the Humber, Leeds, United Kingdom</p>
13.15 – 13.30	<p>O-5 Screening for latent tuberculosis infection in clinical healthcare workers in an NHS hospital trust <i>Simon Howard¹</i> ¹Public Health England, Newcastle Upon Tyne, United Kingdom</p>
13:30 – 14:30	Lunch / Exhibition / Poster Viewing
Session 2: Invited Speaker and Oral Presentation - Oocysts in Water	
14:30 – 15:30	<p>Chair: Lorraine Lighton Organisers: Lorraine Lighton and Philip Veal</p>
14.30 – 15.00	<p>O-6 Cryptosporidium in the water <i>John Astbury¹</i> ¹Public Health England North West, Chorley, United Kingdom</p>
15.00 – 15.30	<p>Challenges presented by Cryptosporidium <i>Rachel Chalmers, Public Health Wales Microbiology</i></p>
15:30 – 15:50	Tea / Coffee / Exhibition / Poster Viewing
Session 3: Oral Presentations - GI	
15:50 – 17:20	<p>Chair: Philip Veal Organisers: Lorraine Lighton and Philip Veal</p>
15.50 – 16.05	<p>O-7 Novel E.coli outbreak <i>Noeleen McFarland⁸</i> ⁸Health Protection Team (Fareham), Public Health England South East, UK</p>

<p>16.05 – 16.20</p>	<p>O-8 VTEC: The time taken to achieve microbiological clearance in the Midlands under - six population, Ireland <u>Abigail Collins</u>¹ ¹Health Services Executive Ireland, Tullamore, Ireland</p>
<p>16.20 – 16.35</p>	<p>O-9 Outbreak of Shigella flexneri at a NHS Trust: Lessons learned <u>Rebecca Hams</u>² ²Bedford Borough and Central Bedfordshire Councils, Bedford, United Kingdom</p>
<p>16.35 – 16.50</p>	<p>O-10 Gastroenteritis outbreak: likely link to reheated prepared food <u>Patricia Garvey</u>¹ ¹Health Protection Surveillance Centre, Dublin, Ireland</p>
<p>16.50 – 17.05</p>	<p>O-11 Gastrointestinal outbreak in a prison during Ramadan <u>Clare Humphreys</u>¹ ¹Public Health England South East, Didcot, United Kingdom</p>
<p>17.05 – 17.20</p>	<p>O-12 The dress rehearsal - a norovirus outbreak before the opening of a new high profile London hotel restaurant <u>Leonora Weil</u>¹ ¹North West London Health Protection Team, Public Health England, London, United Kingdom</p>
<p>18.30</p>	<p>Tours of Cardiff Castle</p>
<p>19.00– 20:30</p>	<p>Drinks & Quiz sponsored by Health Protection Society (HPS) Cardiff Castle Organiser: Lorraine Lighton Quiz Master: Charles Saunders</p>

5 Nations Health Protection Conference

Tuesday 10th May	
08:00 – 17:30 Registration Open / Tea / Coffee	
Session 4: Oral Presentations – Vaccine Preventable Diseases	
09:00 – 10:30	<i>Chair: Louise Coole</i> <i>Organisers: Louise Coole and Suzanna Mathew</i>
09:00 – 09:15	O-13 An epidemiological update following the 2012 national pertussis outbreak <i>Sonia Ribeiro¹</i> <i>¹PHE Immunisation Team, London, United Kingdom</i>
09:15 – 09:30	O-14 A case of toxigenic <i>Corynebacterium ulcerans</i> infection in Scotland: Therapeutic and Public Health challenges <i>Emmanuel Okpo¹</i> <i>¹Public Health, NHS Grampian, Aberdeen, United Kingdom</i>
09:30 – 09:45	O-15 Can the burden of vaccine-preventable diseases in the Charedi, ultra-orthodox Jewish community in north London be reduced using a tailored immunisation programme? <i>Vanessa Rew¹</i> <i>¹Public Health England, London, United Kingdom</i>
09:45 – 10:00	O-16 Pro-active Monitoring of Vaccine Associated Adverse Events <i>Jennifer Bishop¹</i> <i>¹Health Protection Scotland, Glasgow, United Kingdom</i>
10:00 – 10:15	O-17 How avoidable is a measles outbreak? <i>Alex Keenan¹</i> <i>¹Public Health England, Liverpool, United Kingdom</i>
10:15 – 10:30	O-18 A population based study comparing changes in rotavirus burden in a highly vaccinated population in Northern Ireland to an unvaccinated population in Ireland <i>Gillian Armstrong¹</i> <i>¹Public Health Agency, Belfast, United Kingdom,</i>

10:30 – 11:30	Tea / Coffee / Exhibition / Poster Viewing and Poster Walk
Session 5: Oral Presentations – Environmental	
11:30 – 12:30	<p><i>Chair: Charles Saunders</i> <i>Organisers: Charles Saunders and Naima Bradley</i></p>
11.30 – 11.45	<p>O-19 Hospital admissions for CO poisoning in Wales; 2005 to 2015 <u><i>Sarah Jones¹</i></u> <i>¹Public Health Wales, Cardiff, United Kingdom</i></p>
11.45 – 12.00	<p>O-20 Home owner knowledge of radon areas where full radon protection is expected <u><i>Sue Hodgson¹</i></u> <i>¹Public Health England, Didcot, United Kingdom</i></p>
12.00 – 12.15	<p>O-21 Wildfires in Wales: a public health concern? <u><i>Andrew Kibble¹</i></u> <i>¹Public Health England, Cardiff, United Kingdom,</i></p>
12.15 – 12.30	<p>O-22 Mercury incident in a domestic property <u><i>Ceri Riley¹</i></u> <i>¹Public Health England, Manchester, United Kingdom</i></p>
12:30 – 13:30	Lunch / Exhibition / Poster Viewing

5 Nations Health Protection Conference

Session 6: Oral Presentations – Health Protection Practice	
13:30 – 15:00	<i>Chair: Sarah Doyle</i> <i>Organisers: Sarah Doyle and John Cuddihy</i>
13:30 – 13:45	O-23 Avoiding the cost of HCAI in Northern Ireland <i>Janine Martin¹</i> <i>¹Public Health Agency NI, Belfast, United Kingdom</i>
13:45 – 14:00	O-24 How has SH:24, a revolutionary online service, changed the provision of sexual health care in Lambeth and Southwark? <i>Gillian Holdsworth¹</i> <i>¹SH:24, London, United Kingdom</i>
14:00 – 14:15	O-25 The Cinderella of Infections? A review of Invasive Group A Streptococcal Infections in South Yorkshire <i>Eleanor Houlston¹</i> <i>¹PHE South Yorkshire, Sheffield, United Kingdom</i>
14:15 – 14:30	O-26 National survey of farmers: knowledge of zoonoses and infection prevention practices <i>Marrita Mahon¹</i> <i>¹Health Service Executive, Kilkenny., Ireland</i>
14:30 – 14:45	O-27 Ireland's all of Government Response to the Ebola Virus Disease Outbreak in West Africa <i>Colette Bonner¹</i> <i>¹Department of Health, Dublin, Ireland</i>
14:45 – 15:00	O-28 Emergency Response Department Training/Exercises and Assessments in West Africa <i>Mark Evans¹</i> <i>¹ERD, PHE</i>
15:00 – 15:30	Tea / Coffee / Exhibition / Poster Viewing

Session 7: Oral Presentations – Blood borne viruses	
15:30 – 16.45	<p><i>Chair: Kirsty Foster</i> <i>Organisers: Kirsty Foster and Gavin Dabrera</i></p>
15.30 – 16.00	<p>Invited Speaker Responding to blood borne viral infection <i>Noel Craine, Public Health Wales</i></p>
16.00 – 16.15	<p>O-29 The detected prevalence and current epidemiology of hepatitis B and C infection in the primary care registered population in the London Borough of Lambeth, South East London <u><i>Rebecca Cordery¹</i></u> <i>¹Public Health England, London, United Kingdom</i></p>
16.15 – 16.30	<p>O-30 A 2 year review of the free dried blood spot service to increase 12 month testing of infants born to hepatitis B infected mothers offered by Public Health England <u><i>Philip Keel¹</i></u> <i>¹Public Health England, London, United Kingdom</i></p>
16.30 – 16.45	<p>O-31 Responding to alleged infection control breaches in dental practices: a 'repeat' patient notification exercise <u><i>Hazel Henderson¹</i></u> <i>¹NHS Ayrshire & Arran , Ayr, United Kingdom</i></p>
17.00	Health Protection Society Annual Meeting
19:30 – Late	<p>Conference Dinner and Twmpath Bardd Suite, Cardiff Marriott Hotel</p>

5 Nations Health Protection Conference

Wednesday 11th May	
08:00 – 14:00 Registration Open / Tea / Coffee	
Session 8: Oral Presentations - Epidemiology	
09:00 – 10:30	<p><i>Chairs: Chris Whiteside</i> <i>Organisers: Meirion Evans and Chris Whiteside</i></p>
09:00 – 09:15	<p>O-32 Capturing (and recapturing) an invisible population: Bayesian prevalence estimation of problem drug use in Wales using a five-source model <i>Chris Emmerson¹</i> ¹Public Health Wales, Cardiff, United Kingdom</p>
09:15 – 09:30	<p>O-33 What's the big deal? Understanding patterns of use and the hidden harms associated with image and performance enhancing drugs <i>Gareth Morgan¹</i> ¹Public Health Wales, Cardiff, United Kingdom</p>
09:30 – 09:45	<p>O-34 Examining genetic differences in epidemiologically identified Salmonella clusters to inform prospective outbreak investigation using whole genome sequencing <i>Amy Mikhail³</i> ³Public Health England, London</p>
09:45 – 10:00	<p>O-35 The feasibility of anonymised linked health data analysis for public health investigation of E. coli bacteraemia, a population-based retrospective cohort study <i>Julie Arnott¹</i> ¹Public Health Wales, Cardiff, United Kingdom</p>
10:00 – 10:15	<p>O-36 Leptospirosis in the 5 Nations 2000 – 2014 <i>Robert Smith¹</i> ¹Public Health Wales, Cardiff, United Kingdom</p>

10:15 – 10:30	<p>O-37 Information visualisation for epidemiological data <u>Adrian Wensley</u>¹ ¹Public Health England, Leeds, United Kingdom</p>
10:30 – 11:10	Tea / Coffee / Exhibition / Poster Viewing
Session 9: Invited Speaker	
11:10 – 11:45	<p>Chair: Meirion Evans</p> <p>Keynote Speaker Meeting the challenge of emerging diseases; field epidemiology in the age of globalisation and big data Roland Salmon, Chair, Welsh Food Advisory Committee and Board Member for Wales, Food Standards Agency</p>
Session 10: Hot Topics	
11:45 – 13:00	<p>Chair: Dilys Morgan Organiser: Dilys Morgan</p>
11:45 – 12:00	<p>O-38 Hantavirus in pet rats: a zoonotic threat <u>Rhianwen Stiff</u>¹, <u>Robert Smith</u>¹ ¹Public Health Wales, Cardiff, United Kingdom</p>
12:00 – 12:25	<p>Invited Speaker Outbreak of high-level azithromycin resistant Neisseria gonorrhoeae in England Katy Town, Public Health England</p>
12:25 – 12:50	<p>Invited Speaker Zika: responding to an old virus causing new problems Jake Dunning, National Infection Service, Public Health England</p>
12:50	<p>Closing Remarks Dilys Morgan</p>
13:00 – 13:45	Lunch and Delegates Depart

5 Nations Health Protection Conference

GENERAL INFORMATION

Certificate of Attendance

A certificate of attendance will be emailed directly to all registered delegates following the conference.

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. Please also respect speakers and fellow delegates by refraining from talking during presentations. Thank you for your co-operation.

Exhibition

The exhibition will be located in the Ante Suite and will be open at the following times:

Monday 9 th May	13.30 – 15.50
Tuesday 10 th May	08.00 – 15.30
Wednesday 11 th May	08.00 – 13.45

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.

Message Boards

There will be a notice board next to the registration desk for those wishing to leave messages or notifications during the conference.

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 on display throughout the conference. They can be put up from 10.00hrs on Monday 9th May and must be removed by 14.00hrs on Wednesday 11th May.

There will be a dedicated Poster Session for the presenting authors to stand by their boards to allow delegates the opportunity for discussion with the authors.

This has been scheduled at the following time:

Tuesday 10th May 10.30 – 11.30.

During the attended poster session on Tuesday 10th May, there will be a poster walk to highlight interesting posters in each theme. Authors have been asked to stand by their board and summarise the key points in 3 minutes. There will also be the opportunity for a short discussion following this.

The posters included within this are: P-1, P-5, P-11, P-18, P-25, P-28 and P-42

Poster Themes

P-1 – P-3	BBV
P-4 – P-8	Environemnt
P-9 – P-14	Epidemiology
P-15 – P-22	GI
P-23 – P-25	Health Protection Practice
P-26 – P-27	Hot Topics
P-28 – P-31	Respiratory
P-32 – P-49	VPD

Registration/Information Desks

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

The Registration Desk will be open at the following times:

Monday 9th May 08.00 – 17.30

Tuesday 10th May 08.00 – 17.30

Wednesday 11th May 08.00 – 14.00

Tea/Coffee Breaks and Lunch Arrangements

Tea/Coffee and Lunch will be served in the Ante Suite and Zest Restaurant.

5 Nations Health Protection Conference

SOCIAL EVENTS

Cardiff Castle Tour

Monday 9th May, 18.30 - 19.00 Cardiff Castle

There is the opportunity to take a tour of the castle prior to the Quiz on Monday Evening. This event is open to all and the cost is included in the registration fee.

Health Protection Quiz

Monday 9th May, 19.00 – 20.30 Cardiff Castle

This year's Pub Quiz will take place in Cardiff Castle, with drinks sponsored by the Health Protection Society. We encourage you to attend and to take this opportunity to meet with colleagues and friends, old and new. This event is open to all and the cost is included in the registration fee.

Conference Dinner

Tuesday 10th May, 19.30 – midnight Bardd Suite, Cardiff Marriott Hotel

The conference dinner will take place in the Bardd Suite within the Hotel. The evening will comprise of a 3-course meal, followed by a Twympath. If you have not yet registered and wish to attend, please check availability with the Conference Registration Desk.

EXHIBITOR INFORMATION

We gratefully acknowledge the following organisations and companies for their generous support and sponsorship of the 5 Nations Health Protection Conference.



MENINGITIS RESEARCH FOUNDATION

Newminster House, 27-29 Baldwin Street, Bristol, BS1 1LT

Contact Person: Shirley Gieron

Tel No: 0333 405 6267

Freefone Helpline: 080 8800 3344

Email: shirleyg@meningitis.org

Website: www.meningitis.org

Meningitis Research Foundation have been campaigning for a world free from meningitis and septicaemia for over 25 years. We have seen cases halve, and are proud to have contributed to this by raising awareness, providing free information, investing over £18m in 140 research projects and supporting those affected by the disease.



SANOFI PASTEUR MSD

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

Contact Person: Reception

Tel: 01628 785291

Website <http://www.spmsd.co.uk/>

Sanofi Pasteur MSD is a European joint venture formed between Sanofi Pasteur (the vaccine division of Sanofi), and Merck (known as MSD outside the United States and Canada). Combining innovation and expertise, Sanofi Pasteur MSD is the only European pharmaceutical company dedicated exclusively to the distribution of vaccines.

ORAL ABSTRACTS

O-1

Sharing the learning from the first documented outbreak of serious pneumococcal disease in men exposed to welding fumes at a Belfast shipyard, May 2015

Dr Lynsey Patterson^{1,2}, Dr Neil Irvine², Dr Judith Ewing², Dr Anne Wilson², Dr Jillian Johnston², Dr Lorraine Doherty², Dr Anne Loughrey³, Dr Lucy Jessop²

¹Field Epidemiology Training Programme, Public Health England, Belfast, United Kingdom, ²Public Health Agency (Northern Ireland), Belfast, United Kingdom, ³Belfast Health and Social Care Trust, Belfast, United Kingdom

On 29th April 2015, Public Health Agency (PHA) Northern Ireland was notified by a Trust of two hospitalised cases of invasive pneumococcal disease (IPD) in men who worked refurbishing an oil rig at a Belfast shipyard. On 13th May, these cases were confirmed as pneumococcus serogroup 4 and two further linked cases of confirmed IPD were reported.

PHA convened an outbreak control team and with shipyard management identified workers at highest risk (those working on the rig and exposed to metal fumes). Azithromycin or amoxicillin and 23-valent-pneumococcal polysaccharide vaccine (PPV) were offered at shipyard based clinics during 16th-18th May. 680 individuals attended the clinics; 96% received antibiotics and 93% PPV. Staffing at clinics included public health doctors, pharmacists, and Trust nurses. Interpreters for multiple languages were required because approximately 30% of the workforce did not speak English. Workers were employed by multiple contractors with very limited onsite occupational health support and most were not registered in local primary care, leading

to concerned workers attending the local emergency department (ED). 4 symptomatic workers identified at the clinic were referred for assessment at the ED.

This was a challenging response to an outbreak in a large multinational workforce with poor occupational health provision. Close liaison with shipyard management at all stages of risk assessment and response was key. We suggest arrangements for onsite clinical assessment of symptomatic workers should be considered for similar workforces. We recommend that health protection plans include prescribers, vaccine administrators, pharmacists and interpreters.

O-2

Impact of possible cases of Middle East Respiratory Syndrome coronavirus post Hajj in Edinburgh, Scotland

Miss Kirsty Morrison¹, Dr Janet Stevenson¹

¹NHS Lothian, Edinburgh, United Kingdom

Introduction

MERS-CoV was first identified following a cluster of cases in Saudi Arabia in April 2012. Since then there have been large outbreaks associated with healthcare facilities in several countries including Saudi Arabia & S. Korea. The WHO reports no sustained human to human transmission of the virus in the community. But those in close household and hospital setting are at high risk of infection.

There have been a total of 4 confirmed cases in the UK to date.

Local epidemiology of possible cases

Thirty two possible cases of MERS-CoV were recorded in Lothian between August 2014 and Dec 2015. The peak months were post Hajj in Oct 2015 (11 possible cases) followed

by Oct 2014 (4 possible cases).

Impact on clinical services

Of the 32 cases notified to the health protection team 20/32 cases (62.5%) were assessed in the Regional Infectious Diseases Unit, many in quick succession in Oct 2015.

Virological testing results

26/32 (82.3%) of possible cases were tested for MERS-CoV, all were negative. 38.5% were negative for all respiratory viruses tested, 30.8% were positive for influenza, 19.2% were positive for rhinovirus and 11.5% were positive for other infections.

Conclusion

Following on from Ebola, possible MERS cases post Hajj had a measurable impact on the capacity of the Regional Infectious Diseases unit, Virology and Health Protection. Early detection of cases by healthcare facilities is important to ensure isolation and robust infection prevention and control measures are applied.

O-3

Avian Influenza – July 2015 Health Protection Team Response

Mrs Shelagh Snape¹, Dr John Astbury¹

¹PHE, Chorley, United Kingdom, ²PHE, Chorley, United Kingdom

In July 2015 the Cumbria and Lancashire Health Protection Team (HPT) were part of the multiagency response to a confirmed Avian Influenza (AI) outbreak, with the highly pathogenic H7N7 subtype, on a local poultry farm.

170,000 hens were culled and infection control zones set up around the farm. The Animal and Plant Health Agency and the Department for Environment, Food and Rural Affairs managed the animal and

environmental aspects of the outbreak whilst the 102 human contacts were assessed in health clinics set up and run by the HPT, using a Patient Specific Direction contacts were prescribed chemoprophylaxis. Active and passive monitoring and resupply of chemoprophylaxis to human contacts continued throughout the period the farm was classed as an 'infected premises', this process was assisted by the use of HP Zone electronic records and the production of a Patient Group Direction (PGD) which enabled the HPT to react quickly to the rapid influx and exit of contacts at the farm. The PGD has now become a national template document for use in any future outbreaks. Lancashire Teaching Hospital NHS Trust pharmacy department responded well to the HPT requests for resupply of chemoprophylaxis after the HPT sourced supplies from regional and national stockpiles and the Trust acted as the supply conduit for the outbreak health clinics.

The poster gives information about AI, an incident timeline, details of the HPT response and highlights areas of good practice identified in the outbreak debrief and report.

O-4

Complimentary or confusing: the roles of epidemiology and MIRU-VNTR profiling in identifying and managing a challenging TB cluster

Dr Ceryl Harwood¹, Adrian Wensley², Andy Burkitt³, Helen McAuslane¹, Dr Ebere Okereke¹

¹Public Health England Yorkshire and the Humber, Leeds, United Kingdom, ²Public Health England Yorkshire and Humber, Leeds, United Kingdom, ³Public Health England North East, Newcastle-upon-Tyne, United Kingdom

5 Nations Health Protection Conference

Introduction

From 2007-2014, a cluster of 20 tuberculosis (TB) cases were diagnosed in Huddersfield, West Yorkshire, with alcohol dependency a common link. We describe using epidemiology and 24-loci MIRU-Variable Number Tandem Repeat (VNTR) profiling to manage this challenging cluster.

Methods

In 2007-2009, six cases with familial or social links were diagnosed. Additional cases were identified in subsequent years with related demographic profiles. All cases were reviewed in 2015 using health protection records, the Enhanced TB Surveillance database, and knowledge from local TB teams. Information was collated to identify linked cases and map events, guided by epidemiological and strain-type cluster definitions.

Results

32 potentially linked cases were identified. The following cases were excluded: 4 with indistinguishable MIRU-VNTR but no epidemiological links; 3 with possible epidemiological links but incompatible VNTR profiles; 5 with alcohol dependency but without other links or MIRU-VNTR profiling.

20 cases remained in the cluster: 9 had indistinguishable MIRU-VNTR profiles and definite epidemiological links; 11 had similar VNTR profiles (9 with definite familial or alcohol-related links, 2 with possible epidemiological links) but either more than 1 missing loci, different repeat numbers or no MIRU-VNTR available.

Conclusions

MIRU-VNTR profiling supported case inclusion and exclusion when patient and contact histories were unreliable. However, exclusive reliance on VNTR profiles would have omitted 9 cases with definite epidemiological links, and included 2 local cases without links and whose profiles were likely linked to country of origin. We support MIRU-VNTR profiling use,

but emphasise the continuing and superior value of epidemiology in cluster identification.

O-5

Screening for latent tuberculosis infection in clinical healthcare workers in an NHS hospital trust

Michelle Henderson¹, [Dr Simon Howard](#)¹

¹Public Health England, Newcastle Upon Tyne, United Kingdom

Background

The nature of latent tuberculosis infection (LTBI) screening at the point of employment has varied over time throughout the NHS. Diagnosis of acute tuberculosis in two health care workers (HCWs) at a Hospital Trust in the North of England prompted the Trust to undertake a retrospective screening exercise for LTBI among all current clinical employees born in countries with a high TB prevalence.

Methods

Employees from WHO-defined high TB prevalence countries were identified through review of the Trust's electronic staff record and occupational health records. Employees were invited by letter to attend for an interferon gamma blood test (IGRA).

Results

Around 16% of the Trust's clinical workforce were from countries with high TB prevalence. Of the 587 HCWs invited for screening, 469 (80%) attended and were screened using IGRA. 129 HCWs were diagnosed with LTBI (22% of HCWs from high TB prevalence countries; 4% of the whole clinical workforce). 40 HCWs started LTBI treatment.

Discussion

The exercise was complicated by challenging practices around staff record keeping. Nevertheless, it highlights the relatively high prevalence of LTBI within an acute Trust. The

cost effectiveness of the exercise is uncertain, as is the level risk mitigated; the testing costs amount to over £12,000 excluding the nursing costs and costs of follow-up clinics.

The decision of whether to treat HCWs who are well for LTBI can be complex from both the clinician and HCW perspective. Alternative approaches, such as regular reminders of symptoms of active infection, may be preferable.

O-6

Cryptosporidium in the water

Dr John Astbury¹, Professor Rachel Chalmers
¹*Public Health England North West, Chorley, United Kingdom*

At the beginning of August 2015 United Utilities, the local water company, announced a breach of water quality standards: treated water from a large treatment plant was contaminated by low levels of cryptosporidium. The distribution network had been widely contaminated by the cryptosporidium; the cause eluded the best efforts of the water company leading to ongoing contamination.

The initial response was the imposition of a boil water notice across a large proportion of the Lancashire population (approximately 700,000 residents). This was imposed and remained in place for just over one month. During this time the company instituted a range of control measures aimed at sterilising the treated water utilising UV filters.

Due to concerns at the onset of the incident, modelling on the predicted outbreak size was carried out. In the event no cases of cryptosporidium were directly attributable to the outbreak and no exceedance of numbers were detected in the area of the boil water notice. Reasons why have been postulated, these centre on the initial viability of the organisms as the tests currently performed

do not differentiate between viable and non-viable organisms.

This incident represents one of the biggest in recent times and attracted the attention of central government. The water company spent many millions of pounds in control and management and there were many examples of innovative practice and lessons to be learnt. Key to the whole process is the procedures of risk assessment and adaptability.

O-7

Novel E.coli outbreak

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5 Nations Health Protection Conference

Health Dorset, ¹²Food Water and Environmental Microbiology Laboratory, National Infection Service, Public Health England, ¹³UK Public Health Training Scheme, ¹⁴University of Warwick, ¹⁵Environment Agency, Dorset, ¹⁶Animal and Plant Health Authority, Yorkshire, ¹⁷Food Standards Agency

From July 2014 to date there has been an ongoing outbreak of Verocytotoxigenic Escherichia coli O55 (VTEC O55) in Dorset, South West England. Laboratory records show that this strain of VTEC has not been previously isolated from humans or animals in England. This outbreak strain carries a sub-type of verocytotoxin (VT2a) and another gene (eae) which is associated with an elevated risk of haemolytic uraemic syndrome (HUS).

In total there have been 31 cases linked to the Dorset outbreak. Thirteen cases (11 children and 2 adults) developed HUS requiring admission to intensive care for renal dialysis. Two children have long term sequelae and are awaiting renal transplants. One child who is well and asymptomatic continues to shed the virus seven months after their initial infection.

The only epidemiological link common to all the cases has been that they either live or have close links to the county of Dorset. Animal and pets have been tested as part of the investigation and to date VTEC O55 has been isolated from faecal samples from two cats. Whole genome sequencing data confirmed that all the cases were infected with this same strain. The outbreak continues to be managed by an outbreak control team from a variety of agencies including environmental health teams; Directors of Public Health; Animal and Plant Health Agency; Food Standards Agency; Environment Agency; Gastrointestinal Bacterial Reference Unit; Food Water and Environment laboratory and Public Health England South East Centre.

O-8

VTEC: The time taken to achieve microbiological clearance in the Midlands under - six population, Ireland

Dr Abigail Collins¹, Dr Una Fallon¹

¹Health Services Executive Ireland, Tullamore, Ireland

Verotoxin producing Escherichia coli (VTEC) is a significant problem in the under-six population in Ireland. It is spread by person-to-person transmission and children attending child-care facilities are excluded until they achieve two negative stool samples. This can take a prolonged period of time and incur significant hardship on the children, family and crèches involved.

Ten years worth of data from the Midlands was analysed, to ascertain the number of days that children, under-six, take to microbiologically clear VTEC. The data was analysed using Stata and Kaplan-Meier survival curves were plotted. The data was stratified by gender, age, symptoms, organism serotypes and verotoxins. HUS cases and clearance times were also investigated specifically.

The results identified that the median time taken to achieve microbiological clearance for VTEC, in the Midlands under-six population, was 38 days with a maximum clearance time of 283 days. At 40 days post infection, half of the under-six population had microbiologically cleared VTEC, whilst at 70 days 90% had cleared the infection. Those who were symptomatic at diagnosis took a statistically significantly longer period of time to clear infection, than those who were asymptomatic.

These findings on the overall time to clearance were slightly more prolonged, but consistent with, the time periods identified through the international literature.

This report identifies clear data which can be used to more accurately advise parents on the likely period of time required to achieve microbiological clearance.

O-9

Outbreak of *Shigella flexneri* at a NHS Trust: Lessons learned

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Background

In August 2015, PHE was notified of an outbreak of *Shigella flexneri* associated with a hospital. All cases were hospital staff or patients, with illness onset between 20 -31 July 2015. *S. flexneri* is primarily spread through faecal-oral contact and is rare in hospital settings.

Methods

A trawling questionnaire was administered. All cases reported consuming food prepared at the hospital. Because of the delay in identifying the incident, food recall questionnaires were considered to be prone to bias. A food preference case-control study was developed to examine possible associations between food purchasing habits and illness. The study was restricted to staff cases and case-nominated controls. This subset was used for this study for ease of recruitment and follow-up. Participants were interviewed in person or by phone; all data were entered into an on-line questionnaire and extracted and analysed in Stata.

Key Results

Respondents were asked to identify venues they purchased food from. There was no strong evidence to suggest that food purchased at the hospital was associated with the outbreak at a single venue or when all venue variables were combined.

Discussion

Food preference questionnaires are a useful tool to determine if there is a reservoir of contamination to help inform control measures when food recall could be unreliable. Delays in outbreak investigation can lead to unnecessary cross-infection, which is of particular concern for very contagious, though sometimes asymptomatic, infection like Shigellosis. Further, it is important that learning regarding uncommon outbreaks is disseminated to inform public health practice.

O-10

Gastroenteritis outbreak: likely link to reheated prepared food

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Introduction

An outbreak of gastroenteritis was reported at a school event in the south of Ireland. Students from several schools participated.

Materials and Methods

An anonymous online survey tool was used to collect data on clinical symptoms and food exposures among the 177 attendees. A case was defined as an attendee with diarrhoea or abdominal pain with onset within 96 hours of the event start. A cohort study was

5 Nations Health Protection Conference

undertaken to investigate if there was an association between illness and consumption of any of the foods served. Poisson regression was used to estimate adjusted risk ratios (aRR).

Results

The response rate was 61%, with an attack rate of 70% among the 108 respondents. The epidemic curve was strongly indicative of a common point source. Diarrhoea and abdominal cramps were the predominant symptoms. One person was hospitalised. No organism was identified. Multivariable analyses indicated an association with consumption of chicken curry [aRR=3.8 (95% CI 1.4-11, p=0.01)], which was consumed by 95% of cases. Environmental health investigations suggested that reheating of the ready-made chicken curry was very likely to have been inadequate. Anecdotal participant reports of 'cool' chicken supported this. No leftovers were available for testing.

Conclusion

Investigations pointed towards the chicken curry as the most likely vehicle in the outbreak. The findings were consistent with *Clostridium perfringens* or *Bacillus cereus* contamination. Foodborne outbreak investigations without the benefit of microbiological findings pose a particular challenge. Here, extensive and early environmental investigations together with timely commencement of the epidemiological study were key.

O-11

Gastrointestinal outbreak in a prison during Ramadan

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Background

On 29th June 2015 Thames Valley Health Protection Team was notified by a prison of 17/430 prisoners with diarrhoea and some abdominal pain, generally resolving after 48hours. Most affected prisoners were observing Ramadan.

Methods

An outbreak was declared and the prison was given infection control advice and stool samples from affected prisoners were requested. Environmental Health (EH) was notified and visited the prison that same day.

Results

The three stool samples collected were negative for norovirus and bacterial pathogens. One was sent to the reference laboratory for testing for foodborne toxins and was borderline positive for *C.perfringens*. No food samples were available.

The EH visit revealed a number of issues with food safety, hygiene training and kitchen cleanliness. Immediately an action plan was drawn up to address these. Significantly this included failures in the hot holding procedure for holding food consumed after sunset during Ramadan. When EH visited the temperature of the food measured around 40oC three hours before sunset, below the minimum hot holding temperature of 63oC. Hot boxes are used widely across the prison estate and in response a food safety notice was issued to all prisons by the National Offender Management Service.

Conclusion

This was a short lived outbreak. The epidemiology suggests a food-borne toxin

is the likely causative agent given the short incubation period and brief duration of illness in addition to temperature control failures. It demonstrated the importance of checking hot holding procedures particularly during Ramadan and resulted in a new protocol for this.

O-12

The dress rehearsal - a norovirus outbreak before the opening of a new high profile London hotel restaurant

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Introduction

An outbreak of gastrointestinal illness occurred among 229 staff and guests attending six pre-opening tasting events at a new fine-dining restaurant from 28/04/2014-01/05/2014. We investigated the outbreak alongside the restaurant's own HR department, private GP and EHO to identify the source and ensure preventative measures were in place before the restaurant officially opened to the public.

Methods

An electronic questionnaire was sent to

all diners. We compared food exposures among cases and non-cases, and calculated adjusted odds ratios (aORs) and 95% confidence intervals using logistic regression. Stool samples were screened for common gastrointestinal pathogens. EHOs inspected the restaurant and took environmental swabs.

Results

169 people responded (response rate 74%), of whom 62 were cases including food handlers and diners at each event. Daily attack rates ranged from 47% to 14%. The only food item associated with illness was a plaice and cockle dish (aOR=15, p<0.001) served at the first event, accounting for 100% of cases that day. 15/20 faecal specimens were positive for norovirus. No food samples were available for testing. All environmental samples were negative for pathogens. EHOs noted that dishes involving specialist cooking methods and considerable handling by catering staff have the potential for cross-contamination.

Conclusions

Many high-profile restaurants now employ their own GPs, EHOs and associated consultancies. We describe the challenges of managing a traditional outbreak in this setting. By collaborating, we were able to investigate the outbreak thoroughly while maintaining our independent advice and support to the Local Authority who has the regulatory role.

O-13

An epidemiological update following the 2012 national pertussis outbreak

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5 Nations Health Protection Conference

Background

An increase in laboratory-confirmed cases of pertussis in England was observed from late 2011 and continued into 2012 affecting all ages including vulnerable infants. A national outbreak was declared in April 2012. High disease levels and infant deaths led to the introduction of a temporary maternal pertussis vaccination programme from October 2012.

Methods

Laboratory-confirmed cases of pertussis in England during 2012-2015 were reported to the PHE National Infections Service and followed up with general practitioners to ascertain onset, symptoms, vaccination history for all cases and mother's vaccination status in children born from 01/10/2012.

Results

Incidence of laboratory-confirmed pertussis decreased by 51% from a peak of 17.6 per 100,000 (n=9367) in 2012 to 8.7/100,000 (n=4621) in 2013, and 6.4/100,000 (n=3387; 27%) in 2014. However activity increased in 2015 (7.9/100,000; n=4186), whilst remaining 55% lower than 2012 levels. This was observed for all age groups except for those aged 5-9 years in whom cases were higher than in 2012 (7.3/100,000 vs 5.9/100,000).

In England, 482 infants/children born since the maternal vaccination programme was introduced have had confirmed pertussis, with 14 associated infant deaths. Where known, 78% of these cases (336/430) and 12 of 14 infants who died were born to women not immunised during pregnancy.

Conclusions

Raised levels of pertussis continue across all age groups, particularly aged 5-9 years, and this is being monitored. The maternal vaccination programme has shown high levels of protection against pertussis in babies born to vaccinated mothers and continues to be key in preventing infant deaths.

O-14

A case of toxigenic *Corynebacterium ulcerans* infection in Scotland: Therapeutic and Public Health challenges

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Introduction

Respiratory and cutaneous infection caused by toxigenic *Corynebacterium* spp. *C. diphtheriae*, *C. ulcerans*, and *C. Pseudotuberculosis* is a rare notifiable disease in the UK. In recent years the number of toxigenic *C. ulcerans* cases reported in the UK has been increasing. We describe the public health investigation and interventions following a case of toxigenic *C. ulcerans* and the practical difficulties encountered when

seeking to implement national guidance.

Methods

Epidemiological and microbiological investigations were carried out to identify the source of the infection, prevent secondary transmission and protect public health.

Results

Culture specimen of the patient's nasopharyngeal swab grew toxigenic *C. ulcerans*. The case and household contacts had no recent travel history but the patient had contact with a pet rabbit and two dogs during the incubation period. A total of 126 close contacts were identified (122 HCWs and 4 household contacts). Hospital-based HCWs (n=119) were from 9 clinical areas. Nine hospital contacts were excluded. Close contacts had nasal and pharyngeal swabs taken and were offered a diphtheria booster vaccination, +/- prophylactic antibiotics depending on individual risk assessment. No secondary case was identified. A significant amount of time and resource was required to identify and manage close contacts and support the use of prophylactic antimicrobials/vaccines. The animals tested negative for *C. ulcerans*.

Conclusions

This incident highlights challenges experienced in seeking to implement national guidance and the need to balance opportunity cost of disease control measures against maintaining essential health care services. A review of current national guidance is recommended.

O-15

Can the burden of vaccine-preventable diseases in the Charedi, ultra-orthodox Jewish community in north London be reduced using a tailored immunisation programme?

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Background

The London Borough of Hackney has the largest Charedi community in Europe, with over 17,000 persons. Almost a fifth (17%) of Hackney's children are Charedi. Recurrent community outbreaks and clusters of vaccine-preventable diseases, illustrate sub-optimal immunisation coverage. In response, a multi-agency approach worked to identify immunisation motivators and barriers, using the World Health Organisation's initiative "Tailoring Immunisation Programmes", to inform immunisation delivery and reduce disease.

Methods

Mixed methods were used: A descriptive analysis of measles notifications (2006–2013); an in-depth qualitative analysis from a measles outbreak (2012–2013); a parent questionnaire (n=116) and in-depth interviews with approximately 12 parents and 12 key informants, including community health leaders.

Results

Measles rates were four times higher in the community (117 per 100,000 population) than other Hackney residents. Outbreak

5 Nations Health Protection Conference

analysis found some parents unaware their children were not fully immunised; larger families reported a lack of time for immunisations; and a correlation was found between uptake and birth order.

Religion did not appear to influence parental decisions. Some chose to delay infant immunisations, based on own risk perceptions. There appeared a hunger for “unbiased” immunisation information. General practices serving the community have up to three times the proportion of 0-4 year olds, when compared nationally.

Conclusions

There is a need to tailor commissioning and provision of services for this growing community, given the disproportionate disease burden. This should include support for larger families, robust call and recall systems, tailored immunisation information materials and consideration to expand community immunisation clinics including Sunday and home appointments.

O-16

Pro-active Monitoring of Vaccine Associated Adverse Events

Mrs Jennifer Bishop¹, Miss Lynn Wallace¹, Dr Heather Murdoch¹

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In 2013 the vaccines Rotarix®, to protect children against rotavirus, and Zostavax®, to protect older people against shingles, were introduced. At the same time the seasonal flu immunisation scheme was extended to children. When new vaccines are introduced it is important to monitor any potential adverse events. This is done nationally through the Yellow Card Scheme but to more proactively identify potential adverse events in the vaccine cohort population, HPS developed

supplementary monitoring systems using routinely collected national data.

Statistical Process Control (SPC) methods are used to identify whether the observed figures in the post vaccine period are more than expected based on historic pre vaccine data. For each vaccine, a list of possible adverse events was identified along with the associated ICD10 codes. Examples are Intussusception for rotavirus and Guillain Barre syndrome for shingles and flu.

Admissions to hospital for the pre vaccine period back to 2011 were extracted from the national acute hospital episodes database for each diagnosis, age and sex grouping. The historical baseline figures were calculated along with the upper control limits. Hospital admissions are updated monthly and plotted on a control chart. Data points exceeding the upper warning limit are identified as “special cause”. Following the trigger of a signal, detailed investigations of individual patient admissions are undertaken and linked to vaccination records and laboratory reports

Around 35 conditions are monitored by age and sex on a monthly basis. Since the introduction of the vaccines in 2013 no safety concerns have been identified.

O-17

How avoidable is a measles outbreak?

Dr Alex Keenan¹

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Aim: This study examined immunisation data to calculate the susceptibility of a defined cohort for measles.

Background: There was a large outbreak of measles in Merseyside in 2012-13. This was an area with MMR uptake that was higher than the national average, yet an outbreak still occurred.

Method: We examined immunisation data for children born between 1995 and 2006. Data on 48,282 children were interrogated to calculate susceptibility within this cohort both before and after the outbreak.

Results: The levels of susceptibility in those born 1995 – 2006, i.e. those aged between 5 and 17 at the time of the outbreak, are similar both pre and post outbreak. Additionally, the associated effective reproduction number remains above 1.

Conclusion: Measles susceptibility in this cohort was high before the outbreak and remains at similar levels in spite of the additional vaccinations. The associated effective reproduction number is still above the epidemic threshold and therefore there is still the possibility of another outbreak within this cohort despite a large number of additional vaccinations. The simple calculations can be repeated by any interested Local Authority or Clinical Commissioning Group to assess susceptibility within their area.

O-18

A population based study comparing changes in rotavirus burden in a highly vaccinated population in Northern Ireland to an unvaccinated population in Ireland

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Background

Rotavirus infection is a leading cause of gastroenteritis in infants and children globally. Targeted rotavirus vaccination with Rotarix® was introduced in Northern Ireland in July 2013, but not in Ireland. Northern

Ireland and Ireland have similarities in climate, demography, morbidity and mortality but have distinct health administrations and vaccination policies. This situation presents a natural experiment. The aim is to examine the impact of rotavirus vaccination in Northern Ireland and compare disease activity with a quasi-control unvaccinated population.

Methods

A number of population based measures of disease burden were compared in both jurisdictions pre-vaccine (six years; 2007/08-2012/13) and post-vaccine (two years; 2013/14-2014/15). The data sources included national rotavirus surveillance data based on laboratory reports/notifications; hospital admission data; and notifications of gastroenteritis in under 2 year olds.

Results

In the post-vaccination period, rotavirus incidence in Northern Ireland dropped by 54% while in Ireland it increased by 19% compared to the pre-vaccine period. Notifications of gastroenteritis in under 2s declined by 53% and hospital admissions in under 5 year olds declined by 40% in the post vaccine period in Northern Ireland.

Conclusions

Significant and sustained reductions in rotavirus burden have been experienced in Northern Ireland following rotavirus vaccine introduction, with associated reductions in healthcare utilisation. These sustained reductions have not been observed in neighbouring Ireland. These findings support rotavirus vaccination as an effective measure to reduce childhood morbidity.

5 Nations Health Protection Conference

O-19

Hospital admissions for CO poisoning in Wales; 2005 to 2015

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The burden of carbon monoxide (CO) on health and health services is difficult to describe. Symptoms, including headache, dizziness, nausea and vomiting, are non-specific and rapidly abate once the person is removed from the source of the exposure. However, without data on health service utilisation for treatment of CO poisoning, it is difficult to justify action.

This paper aimed to give a broad overview of CO poisonings admitted to hospitals in Wales between 1/01/2005 and 31/12/2015.

The Patient Episode Database for Wales (PEDW) was analysed to identify cases with ICD-10 code T58 (toxic effect of CO) at any diagnostic position. Admissions with a diagnosis of T20 to T32 (burns) and X00 to X19 and Y26 (fires and burns) were removed, as were X60 to X84 (intentional self harm).

There were 334 admissions of 322 individuals, relating to 272 incidents; on average 30 individuals admitted per year. Of the 322 individuals, 153 (47.5%) were female, 13.7% were aged 0 to 9 years, 35.1% were aged over 60 years. 25 were resident in England at the time of the incident. 8 were pregnant. One quarter (25.2%) of individuals were resident in the most deprived areas, compared with 13.3% in the least deprived.

There is less than one hospital admission per week in Wales for CO poisoning. However, it is likely that all analyses of routine datasets for CO poisoning are low estimates of the true burden. Efforts to encourage clinicians to report cases for health protection management must be mindful of this.

O-20

Home owner knowledge of radon areas where full radon protection is expected

Mrs Sue Hodgson¹, Miss Victoria Pudner¹, Ms Jane Bradley¹, Mr Neil McColl¹

¹Public Health England, Didcot, United Kingdom

New homes in areas of high radon risk should include radon protection, typically comprising a gas-tight barrier with provision for additional measures that can be activated if the need is indicated by a radon test made once the home is occupied. A survey of owner occupiers of relevant new properties, sought to understand the extent to which the occupiers were aware of and had taken action on radon. A minority of householders reported that they had key information and advice on radon, suggesting there is scope for improvement.

Recommendations are made to improve householder awareness, focusing mainly on enhancements to existing information channels that form part of the process of buying a new home. Improvements are also suggested to online information sources along with potential means to remind home owners about radon after they move into a new home that may have radon protection.

O-21

Wildfires in Wales: a public health concern?

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Introduction

Over 15,500 wildfires were recorded between 2011 and 2015 in Wales. Wildfire smoke

is toxic and can contain large amounts of particles and harmful gases. Last year the Welsh Government held a 'grass fires summit' to develop a programme of action ahead of the 2016 wildfire season. As a result we have been working with partners to support this programme and raise awareness of the potential impact on public health.

Methods

Current activities include a project to review local authority preparedness, analysis of wildfires in Wales and their impact on public health, and the development of a wildfire toolkit containing key messages and interventions.

Results

Data on the location, size and duration of wildfires has been analysed and potential exposure to smoke estimated. The wildfire season peaks in April/May with the South Wales Valleys having the greatest frequency of wildfires. Over the study period it was estimated that there was a total of 11,512 person-years exposure to wildfire smoke.

Key public health messages have been developed and shared with key partners under Operational Dawns Glow; a multi-agency "silver" which will coordinate the operational response during the 2016 wildfire season. Health messages have also been incorporated into the current "Bernie" school campaign (<http://www.bernie.uk.com/>). A review of health data on respiratory conditions is also planned.

Conclusion

Public Health Wales and CRCE-Wales are working with partners to raise awareness of wildfires as a potential public health problem and is developing tools and materials to assist in their management during the 2016 season.

O-22

Mercury incident in a domestic property

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¹Public Health England, Manchester, United Kingdom, ²Public Health England, Greater Manchester, United Kingdom, ³Public Health England, Cumbria and Lancashire, United Kingdom

This presentation/poster describes an incident involving spillage of approximately 150mls of elemental mercury in a residential property. This was an unusual indoor contamination incident which caused a risk to health because it occurred in a private home and required consideration of vulnerable receptors; children and occupants. The incident background will be outlined followed by a description of the actions during the response and recovery phases.

The spillage of mercury had contaminated various parts of the building, with initial concentrations in air up to 900µg/m³. Monitoring and decontamination was carried out by a contractor in liaison with the local authority and the Government Decontamination Service. The results obtained as work progressed will be presented, with a discussion on the various levels detected in different parts of the house. Concentrations fell over several months to less than 10µg/m³ but remained above the WHO Air Quality Guideline value of 1µg/m³. The overall decontamination strategy undertaken to enable reoccupation will also be presented, alongside a discussion of the limitations and complications encountered.

The presentation/poster will address the public health management response and subsequent complex issues relating to decontamination during such incidents in residential settings.

There will be discussion of the issues around relevant legislation (Health Protection

5 Nations Health Protection Conference

Regulations 2010) and the pros and cons of applying it effectively in this situation.

To conclude, there will be a summary of lessons learned from the incident and recommendations for future actions in response to mercury spillages to limit or reduce the impacts on public health.

O-24

How has SH:24, a revolutionary online service, changed the provision of sexual health care in Lambeth and Southwark?

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¹SH:24, London, United Kingdom, ²KCl, London, United Kingdom, ³Southwark Council, London, United Kingdom

SH:24 uses internet and phone technologies to deliver sexual and reproductive healthcare remotely, 24/7, in partnership with local providers. The results and lessons learnt since the service went live in 2015 will be presented.

We will describe SH:24's development using a design led approach and the benefits this has brought to service development. User and stakeholder views have informed all stages of SH:24 development. Key metrics will be presented from SH:24 and local sexual health providers to describe how service use across the local sexual health economy has changed. Early evidence of the impact on local population sexual health will be discussed. The costs and impact of the service on the local sexual health economy have also been assessed.

SH:24 achieves a 72% return rate, higher than other online services. The diagnostic rate is 11% (12-14% in local clinics), although 95% of users risk profile will place them as asymptomatic. SH:24 can describe how they

socialised the product around users online to promote and manage service activity.

Lambeth and Southwark experiences some of the worst rates of sexual ill health in the country and an innovative, efficient and cost-effective solution was needed. SH:24 is meeting that need and has improved access to sexual health services for the local population. The long term aim is to provide a comprehensive sexual health and contraceptive service for local residents whilst realising efficiency savings for commissioners. SH:24 has also started to secure contracts in other regions and will continue to develop and scale up.

O-25

The Cinderella of Infections? A review of Invasive Group A Streptococcal Infections in South Yorkshire

Mrs Eleanor Houlston¹

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The epidemiology of Invasive Group A Streptococcal (IGAS) infections in South Yorkshire notified over the 5 year period 2010 to 2014 was reviewed and an audit of public health management of cases with a date of onset between 1 July 2014 and 31 December 2014 was conducted against standards based on guidance. Both IGAS and severe Group A streptococcal infections were included.

A total of 246 cases of IGAS were notified in South Yorkshire over the 5 year period. IGAS was more common in men than women and this was statistically significant in the 40-79 age group. Increased numbers occurred during winter and spring months. There was an increase in 2013 compared to the other years.

8.9% of cases were injecting drug users and 41.5% of cases had co-morbidities recorded.

Diagnosis was based on blood culture in 56.1% of cases. 17.1% of cases died and in at least 3 instances secondary spread was suspected.

A total of 25 cases were audited. Of which, 24% were injecting drug users. Contacts of 66.7% of injecting drug users and 57.9% of others were traced. Contacts who needed chemoprophylaxis were identified and referred to their GP in 16% of cases.

Despite higher case fatality rates and potentially linked cases, public health management of IGAS is often given less priority than other serious infections and, anecdotally, this does not appear unique to South Yorkshire. Improved management, documentation and data collection could lead to availability of a better evidence base for prevention and control of IGAS.

O-26

National survey of farmers: knowledge of zoonoses and infection prevention practices

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Aim

To ascertain farmers' knowledge of the risk of spread of infection from animals to humans and their transmission prevention practices.

Methods

A survey of farmers who submitted material to the State's six Regional Veterinary Laboratories between February and July 2015.

Results

There was an 84% response rate (1044 farmers). The mean age was 46 years, with

92% male. A high percentage of farmers (90%) were not aware that infection can be acquired from apparently healthy animals. Over half were not aware of the risk to children of contracting infections causing vomiting and diarrhoea from animals. Slightly over half were not aware that disease could be contracted from sick poultry or pets. The knowledge of the risk to pregnant women of infection from birthing animals was high (88%). Of responding farmers, 59% sourced drinking water from a private well. Of these, 62% tested their water less frequently than once a year. Of responding dairy farmers, 39% drank unpasteurised milk once a week or more frequently. Most farmers indicated using more than one information source for diseases on farms, with veterinarians the most commonly cited.

Conclusions

The survey findings indicate that the level of farmers' knowledge and awareness of the spread of infection from animals to humans is a concern. Further, this survey has identified the need for further education of the farming community to increase awareness of both the potential biohazards present on farms and the practical measures that can be taken to mitigate the risk of zoonoses.

O-27

Ireland's all of Government Response to the Ebola Virus Disease Outbreak in West Africa

Dr Colette Bonner¹

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This presentation is designed to give an overview of the total government response to Ebola Virus Disease in West Africa. It describes Ireland's Emergency Response and Preparedness structures and how this was activated to respond to this particular emergency.

5 Nations Health Protection Conference

The presentation covers the key areas of legislation, government coordination, communication, health service response, recovery and lessons learned.

O-28

Emergency Response Department Training/Exercises and Assessments in West Africa

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Following the outbreak of Ebola in West Africa, Emergency Response Department (ERD) Public Health England (PHE) with Public Health Wales and NHS England (National Ambulance Resilience Unit - NARU) have been training/exercising and assessing preparedness in West Africa for response to Ebola and latterly a more widely, 'One Plan All-Hazard' approach.

Throughout 2015 and 2016 to date, PHE ERD and U.S. Communicable Disease Centre (CDC) were responding as part of the WHO Ebola Virus Disease Preparedness programme by training national and regional teams in-country, through table top, command and simulated operational Rapid Response Team exercises, involving PPE donning and doffing. This training was in addition to PHE's extensive work with laboratories in country.

The training has included Rapid Response Team Training in Cameroon, National and Regional Emergency Operations Centre training in Cote d'Ivoire and Sierra Leone and most recently, as part of WHO missions to assess preparedness in The Gambia, Togo, Niger and Tanzania [DFID-WHO initiative]. The subject of these exercises ranged from Ebola, Cholera and meningitis.

All have proved successful as judged by

participant, stakeholder and observer feedback. All visits were tailored to the needs of each individual country, depending on its state of preparedness and all have been with the close collaboration and involvement of the Ministry of Health in each country.

We will describe the different exercises/assessments undertaken, the overall WHO EVD dashboard to evaluate progress and the new WHO All Hazard (One Health) approach using the new Joint External Evaluation tool.

O-29

The detected prevalence and current epidemiology of hepatitis B and C infection in the primary care registered population in the London Borough of Lambeth, South East London

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Lambeth is a diverse inner London borough with one of the highest estimated prevalences for both hepatitis B and C virus infections (HBV and HCV) in the UK. There are a number of reasons for this: a substantial resident migrant population, an increased prevalence of at risk groups (including people who inject drugs and sex workers); sex on premises venues and a large prison population.

Patients quiescent on GP practice lists may not receive appropriate follow-up or benefit from cost effective treatments.

A collaborative project between the Local-Authority based Lambeth & Southwark public health team and SE London Health Protection team analysed HBV and HCV infection data extracted from GP practices. Information governance challenges required significant

engagement with practices but resulted in a dataset drawn from the majority of Lambeth practices.

We describe the epidemiology and highlight previously unrecognised characteristics of these patient groups.

The detected prevalence in the GP registered population for HCV is 3.7 per 1000; for HBV is 2.6 per 1000. The peak detected prevalence is in males aged 40-49 at 11.8 per 1000 for HCV and 5.5 per 1000 for HBV. The true prevalence is likely to be higher as records with equivocal coding were excluded from analysis. After English, Portuguese, Italian and Polish are the most frequent main languages spoken.

Individual Practice level HBV and HCV profiles for GPs are planned to assist clinicians with detection and case management. We hope this new intelligence assists GPs in focussing testing, patient education, and referral for treatment.

O-30

A 2 year review of the free dried blood spot service to increase 12 month testing of infants born to hepatitis B infected mothers offered by Public Health England

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Each year approximately 3000 infants are born to hepatitis B (HBV) infected mothers and are at risk of perinatal transmission. Following vaccination, uptake of 12 month testing to determine an infant's HBV infection status is poor; where known, <55% of infants born to high risk HBV infected

mothers were tested between 2004-2014. Difficulty in obtaining venous blood samples in primary care has often been reported as a contributory factor to this low uptake. After a successful pilot period (2011-13), a free dried blood spot (DBS) service using a heel-prick to test infants born to HBV positive mothers was offered nationally in September 2013.

Between Sept 2013 to Dec 2015, 1120 samples were tested for hepatitis B surface antigen (HBsAg) as part of the routine service. Of these 5 (0.44%) were HBsAg positive (1 unknown). Where vaccination status was known, the proportion who had received dose 1 and 2 was 99.9% and doses 3 and 4 was 99.7%.

The DBS service has also been used to support lookback exercises where incidents have been declared due to missed testing. An additional 166 samples have been tested, of which 2 (1.2%) were HBsAg positive. Where vaccination status is known the proportion vaccinated was over 99%.

Promoting the DBS service and exploring ways to encourage wider geographical coverage of the service is essential to increase 12 month testing of infants at risk of HBV perinatal transmission. Areas of high antenatal HBV prevalence, such as London may benefit most from the DBS service.

O-31

Responding to alleged infection control breaches in dental practices: a 'repeat' patient notification exercise

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A large patient notification exercise was undertaken in Ayrshire following alleged infection control breaches in two dental practices. Letters were sent to 5100 dental patients informing them of the breaches. As

5 Nations Health Protection Conference

risk to patients was extremely low, testing was not recommended.

In response to this exercise and the resulting publicity, new and more serious allegations emerged from another source. The incident management team reconvened to make a risk assessment following the new allegations. Patients were notified again, with blood borne virus testing offered as a precaution. The GDC are investigating whether breaches occurred and were covered up by practice staff.

Over 2000 patients underwent testing. No HIV or Hepatitis B cases were identified, but less than five Hepatitis C cases were diagnosed. It was not possible to ascertain whether Hepatitis C transmission occurred at the practice. The incident lasted 19 months and cost to the Board was over £236,700.

This incident raised serious concerns about the ability to assure infection control standards are being met within dental practices. Had the Board not been notified of these breaches, it is unlikely they would have come to light under the system of announced inspections (both practices had passed recent announced inspections). The benefits of patient notification in such instances, where risk to patients is very low, is doubtful compared to the costs to patients (and financial cost). How confident can we be that breaches are not occurring in other dental practices, and not always being picked up using the current inspection system?

O-32

Capturing (and recapturing) an invisible population: Bayesian prevalence estimation of problem drug use in Wales using a five-source model

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Introduction

'Capture recapture' methods have become established as the preferred method for estimating the 'invisible' population of drug users not in contact with services. In response to theoretical and empirical issues with previous three-source Maximum Likelihood Estimation methods, a five-source Bayesian estimate was undertaken by Public Health Wales with the support of statisticians from the Universities of Edinburgh and Glasgow.

Method

Data were gathered from five sources: police arrest records, hospital admissions, probation/youth offending assessments, assessments for treatment and transaction records of needle and syringe programmes. Records were matched on first and last initial, date of birth and gender and the resulting contingency tables analysed using Conting, a Bayesian statistical package developed in the R programming language.

Results

Estimates were stratified by Health Board, gender, age band and substance type (opioid, crack/cocaine and amphetamine type substance, ATS). The initial estimate for Wales was 58,906 problem drug users.

Discussion

These figures differ substantially from previous estimates, but better reflect evidence from newly available data sources.

No previous estimates of problem drug use using a Bayesian analysis of five distinct sources model are known to the authors. The estimates produced were substantially different to previous estimates and provide a robust basis on which to develop policies, strategies and services in Wales. In addition to providing robust analysis of problem drug use in Wales, the project has the scope and ethical permission for novel analyses of the illicit drug using population of Wales including estimates of injecting and patterns of initiation and cessation.

O-33

What's the big deal? Understanding patterns of use and the hidden harms associated with image and performance enhancing drugs

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Over the last few decades, increases in production and availability of Image and Performance Enhancing Drugs (IPEDs) have meant that their use has become more widespread amongst men and women of all ages and backgrounds. Currently in Wales over 50% of unique individuals accessing Needle and Syringe Programmes (NSPs) for sterile injecting equipment report the use of IPEDs as their primary substance of use. Those who inject any substance without medical supervision are at significant risk of acquiring a blood borne virus such as hepatitis B, hepatitis C and HIV, or bacterial infection. As such the use of IPEDs poses serious public health concern.

Empirical research and evidence surrounding the prevalence, nature and impact of IPED use is extremely limited. As a consequence Public Health Wales have collaborated with Centre for Public Health (Liverpool John Moores University) and Public Health England in developing the UK's first annual IPED survey designed to evidence, over time, the nature and scale of IPED use across the UK; physical and psychological health harms experienced by users; and other associated risk behaviours.

With over 660 IPED users participating in 2015, early editions of the survey identified a wide range of risk behaviour practices, including early age of initiation, and low uptake of BBV services including testing and vaccination.

The survey, combined with existing national data sources will support PHW to better equip commissioners and relevant health service providers such as NSPs to further develop health care messages and interventions designed to reduce risks and harms.

O-34

Examining genetic differences in epidemiologically identified Salmonella clusters to inform prospective outbreak investigation using whole genome sequencing

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Whole genome sequencing (WGS) of Salmonella has been routinely carried out since April 2014 in England and Wales. WGS has been shown to identify clusters of cases with epidemiological links. This work used

5 Nations Health Protection Conference

epidemiologically defined clusters from North East England to assess genetic differences between their cases. The results will inform determination of thresholds of genetic differences that can be used for prospective cluster identification.

All epidemiologically identified clusters of Salmonella from North East England where the cases had been whole genome sequenced were included in this analysis. For each cluster, arbitrary thresholds were used to give a genetic differences overview. We used up to 10, 5 and 0 single nucleotide polymorphism (SNP) thresholds. For each cluster, the average and range of pairwise SNP differences was also calculated.

Nine epidemiologically identified clusters were included in the analysis. The clusters ranged in size from 2 to 29 cases (median 3 cases). There were four Typhimurium, four Enteritidis and one Agona cluster. One of the clusters contained multiple species of Salmonella. No cluster cases of the same species exceeded the 5 SNP threshold. The average pairwise difference overall was 0.82 with a range of 0 to 3 SNP differences.

This analysis showed that epidemiologically identified clusters from North East England contained genetically similar cases. All cases were within a 5 SNP threshold and the average pairwise genetic difference was 0.82. This study provides evidence that a 5 SNP threshold is appropriate to use when prospectively identifying outbreaks using whole genome sequencing data.

O-35

The feasibility of anonymised linked health data analysis for public health investigation of E. coli bacteraemia, a population-based retrospective cohort study

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Objectives

To examine the feasibility of anonymised linked health data analysis for public health investigation of E. coli bacteraemia (ECB), a population based retrospective cohort study.

Methods

From routine microbiology surveillance, datasets were created of E. coli blood and urine culture records from 2005 to 2011 in Wales. The data was anonymised by the NHS Wales Informatics Service (NWIS) and electronically linked with administrative healthcare usage datasets within the Secure Anonymised Information Linkage (SAIL) databank.

Results

From the 10,511 distinct ECB patients identified; 5,311 had a GP record in SAIL at any time point in the study (50.5% linkage); 97% (10,208) were linked with an inpatient event and 72% (7,567) were linked to an outpatient event during the year prior to ECB; 36% (3,754) were linked to a mortality record within 1 year post-ECB; 30% (3,249) were linked to a positive E. coli/coliform urine culture within 14 days prior to ECB; and 20% (2,079) were linked to an A&E attendance during the 3 months prior to ECB. Limitation: SAIL began collecting A&E data on 01/04/2009. Linked health data models were created; Survival analysis and

cox regression analysis of mortality post- ECB, Inadequate treatment of E. coli UTI and ECB, trimethoprim resistance in E. coli urine culture and ECB, risk factors for developing ECB in the over 65 population, a case- control study.

Conclusions

Linked health data analyses determined risk factors for developing- and the rise of- ECB in Wales. Linked health data analysis is feasible for public health investigation.

O-36

Leptospirosis in the 5 Nations 2000 – 2014

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Leptospirosis is a zoonotic disease of global distribution with a large range of animals acting as carriers or intermediary hosts. Contact with the urine of infected animals poses the major risk to humans. Leptospirosis is considered an emerging global public health issue both in local populations and in returning travellers.

Between 2000 and 2014, eight hundred and thirteen reports of leptospirosis acquired indigenously were confirmed by the *Leptospira* Reference Unit (LRU) with a further two hundred and sixty four travel associated cases.

Patients ranged from 4 to 82 years of age with a 12.1: 1 male to female sex ratio. Leptospirosis in our region has a seasonal trend with most cases occurring in the autumn, September to December.

Putative identification by Microscopic Agglutination Test (MAT) of the infecting serovar indicates that *L.interrogans* serovar *Icterohaemorrhagiae* remains that most often identified. *L. interrogans* serovar *Hardjo* cases, a serovar most commonly associated with

cattle in this region, has decreased in England and Scotland but maintains a strong presence in Ireland. A wide range of serovars identified in returning travellers reflects the expanding geographical range of travel.

Traditionally an occupational disease, recreational acquisition is increasing particularly in those who indulge in water related activities. This pattern is also observed in returning travellers where 177 (67%) cases cited water related activities.

O-37

Information visualisation for epidemiological data

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The Public Health England Field Epidemiology Service conducted a project to assess the potential of information visualisation methods in effectively delivering health protection messages. Whilst information visualisation techniques have been used for many years, recent software developments have made high quality visualisations significantly easier to implement. These applications offer new opportunities for authors to express technical health protection and epidemiological information in an accessible and attractive format.

Here we present the projects findings, which are based on information collated by a working group's assessment of a wide range of information visualisation techniques and software. We summarise key information visualisation literature to classify distinct data presentations relevant to health protection. This is focused on expressing measures such as probabilities and risk estimates which can be difficult to communicate effectively to lay audiences.

5 Nations Health Protection Conference

For many audiences tables of numbers and basic bar charts have low impact and accessibility. We present recommendations for incorporating enhanced visualisation techniques and methods of overcoming key problems in utilising these techniques. The application of information visualisation can assist the audience to not only understand the underlying data, but to frame the information in a way that communicates the meaning and implications. Presenting visual information in this way addresses the need to translate technical evidence into an accessible format for use by a range of decision makers.

by APHA Weybridge. Partial gene sequence analysis indicated the SEOV strain to have a high degree of similarity to those detected in previous UK pet rat cases; work is ongoing with RIPL, PHE Porton, to compare human and rat-derived sequences.

Although previously recognised in the UK fancy rat population, these incidents highlight that feeder-breeder rats may also pose a risk of hantavirus infection to individuals who come into contact with infected rats, through occupational exposure at rat breeding farms, or through handling rats intended as reptile feed.

O-38

Hantavirus in pet rats: a zoonotic threat

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Three cases of acute hantavirus (Seoul virus) infection were identified in SE Wales in 2015. All were epidemiologically linked by the transfer, breeding and husbandry of domestic (fancy) and/or feeder rats (bred as reptile food). The first case became unwell with acute hantavirus infection. He kept a small number of fancy rats as pets, and over 300 feeder rats bred as reptile feed, and for sale online. A family member of the first case also became unwell. A third case had a small number of pet rats in the household and worked at a large commercial rat breeder producing reptile feed for the retail pet trade. Two cases were indirectly linked through a rat sold online via an intermediary. Screening of suppliers, customers and contacts of the cases identified a further seven individuals with serological evidence of hantavirus infection, some with previously undiagnosed compatible illness.

Seoul virus (SEOV) RNA was detected by RT-PCR in the kidneys of randomly selected rats

POSTER ABSTRACTS

P-1

Tattooing, Acupuncture, Electrolysis and Cosmetic Piercing: Identifying and mitigating the risks from special procedures

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Special procedures are currently regulated in Wales via the Local Government (Miscellaneous Provisions) Act 1982. This Act enables local authorities to require businesses to be registered and ensures infection control arrangements are adequate. Responding to inadequacies with the current system, the Public Health (Wales) Bill proposes a compulsory licensing system in Wales. In order to perform any special procedures, an individual must be licensed and the premises or vehicle from which they operate, approved.

To inform requirements for any eventual licensing system, evidence of adverse outcomes were identified through a literature review. Over 7000 articles were screened sequentially by title, abstract and full text with 241 meeting defined inclusion and exclusion criteria.

Risks were associated with the procedures, requiring identified areas of practitioner competence. The likelihood of serious adverse consequences is dependent on the procedure being undertaken. Whilst good practice reduces risks, it cannot eliminate them; consequently, a good understanding of the possible adverse events is required. Practitioners are the main source of advice to clients about problems both before the procedure and in the event of them occurring. Lack of suitable advice has led to life threatening consequences.

In conclusion all practitioners should have sufficient knowledge of the procedure being carried out, basic infection control and potential adverse events to ensure:

- risks are minimised;
- aftercare is appropriate;
- adverse consequences are recognised and actioned appropriately; and
- clients have sufficient information to enable informed consent to the procedure to be given.

P-2

Hepatitis C Testing within South Asian Communities in Greater Manchester

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Although limited, the literature consistently describes higher rates of hepatitis C infection within people of South Asian descent resident within the UK, compared to rates of infection across the UK as a whole. This is relevant to health partners in Greater Manchester as there are believed to be over 150,000 people of South Asian descent living in Greater Manchester, so Public Health England and the Hepatitis C Trust worked with NHS stakeholders to offer education followed by hepatitis C antibody testing to those at risk.

Stakeholders worked collaboratively to design a patient pathway and a communications plan to promote awareness of the events amongst both the community and professionals.

5 Nations Health Protection Conference

Testing was offered over a 3 day period: the first day of testing was held at a large mosque in Manchester and 2 further days of testing were offered at the '2015 Manchester Mega Mela'.

Overall 377 people were offered education and testing over the 3 day period. Of these, 208 people were eligible and accepted the offer to be tested for hepatitis C antibodies: 4 people tested positive, and 4 test results were undetermined, so a total of 8 people were formally referred to their GP for diagnostic testing.

In addition to facilitating referral for diagnostic testing for those testing positive, and raising awareness about hepatitis C transmission amongst this community, this case finding exercise has also added to the limited evidence base on hepatitis C testing in south Asian communities.

P-3

Creating a Hepatitis C Case Register - System Design, Implementation & Outputs

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Hepatitis C is a bloodborne infection mainly affecting those from marginalised and underserved groups including people who inject drugs. There are an estimated 214,000 individuals chronically infected with hepatitis C in the UK. Without successful treatment hepatitis C can have serious consequences. Deaths from hepatitis C related end stage liver disease and liver cancer have doubled over the last decade.

We have designed a hepatitis C "Case Register" database in SQL Server, pulling

together patient information from multiple sources and incorporating population statistics with the ultimate aim of improving our descriptive epidemiology and determining how successfully newly diagnosed patients are accessing treatment.

Patients with hepatitis C are often tested more than once so the system performs a series of deduplications to identify their earliest diagnosis, avoiding any over-counting in epidemiological analyses.

However, to achieve the very best quality data we had to merge information from any number of positive tests in SGSS, and any available HPzone records.

In this way we managed to improve patient demographic data e.g. recognising that a patient has moved home or changed GP since their original diagnosis.

Capturing this augmented data is key to correctly identifying where you would expect patients to have been referred to and has the potential to assist CCGs in commissioning Hepatology services appropriately.

By linking the database with records of patients accessing Hepatology services in the Addenbrooke's Hospital catchment area we will be able to take a major step towards identifying how well patients are managing to access appropriate treatment.

P-4

Recycling facility fires – Wales, April to December 2015

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Welsh Government policies encourage

recycling to improve health and the environment in the long term, but there may be short term, acute impacts from recycling facility fires.

The Environmental Public Health Service in Wales, a joint working approach between Public Health Wales and the Centre for Radiation, Chemicals and the Environment within Public Health England, in Wales (CRCE-Wales), records service activity on a joint database. The database was interrogated to identify fires occurring between 01/04/2015 and 31/12/2015. Recycling facility fires were identified and the consequences described.

There were 48 entries; 15 related to fires in 11 recycling facilities. Two entries were two fires at the same facility two months apart. One was a site that saw fires on two separate occasions in 2014.

Air Quality Cells were convened for three fires; monitoring kit deployed for two. Four entries, relating to two fires, were requests information about the health impacts of the smoke plume. Press releases were issued via the multi-agency incident management teams.

The time taken to deal with these fires ranged from minutes to many hours by five or more staff. One fire smouldered for two months and required daily assessment

Dealing with the public health impacts of recycling facility fires places a significant burden on public health services in Wales. Without intervention, as recycling targets continue to increase, fires may increase; this is likely to be an issue across the UK. Public health agencies need to work with regulators to reduce these incidents.

P-5

An unusual incident; carbon monoxide poisoning risk in 540 homes due to faulty wood burner installations

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In December 2015 it emerged that over 500 woodburners may have been installed incorrectly across Pembrokeshire by one registered engineer, leading to an increased risk of carbon monoxide (CO) poisoning and fire for residents. An incident management team (IMT) was convened to assess and manage the risk to affected residents through a look back exercise.

The IMT included representatives from Public Health Wales, Pembrokeshire County Council, the Heating Equipment Testing & Approval Scheme (HETAS), Hywel Dda University Health Board, PHE CRCE Wales and Mid and West Wales Fire and Rescue service.

The IMT identified a cohort of residents known to have had wood burners installed by this engineer. Letters were sent warning them of the risks and directing them to HETAS to arrange for testing of their appliance. Free CO alarms were also made available for affected residents through local leisure centres. A press release was issued to reach those who may have missed the letter or not had their installation registered with HETAS, and to remind people about the importance of having a CO alarm. Emergency Departments and GPs in the area were also reminded about the symptoms of CO poisoning.

This incident highlighted that even registered engineers may fail to follow guidelines. It is therefore important to inform the public of the need to have a working CO alarm within

5 Nations Health Protection Conference

their home, as well as educating people and professionals about the symptoms and signs of CO poisoning.

P-6

Potassium iodate distribution

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Pre-distribution of stable iodine as a counter-measure for radioactive iodine 131

Since 1986 the safety case for the mass prescribing of potassium iodate as a protective measure against radioactive iodine 131 has been strongly recommended. Potassium iodate is a Pharmacy Advice Drug in the UK which requires distribution by trained paramedical staff, on a PGD, or medical staff. Cumbria and Lancashire centre has two nuclear sites: Heysham and Barrow-in-Furness, both are surrounded by a significant population (mixed residential and commercial). Pre-distribution has been carried out at these two sites for 25 years on a commercial basis without significant incident.

The health authority in Morecambe Bay instituted the first pre-distribution scheme in the UK to ensure stable iodine was available to all those identified as being within counter-measure area in the Detailed Emergency Planning Zone. HPA and PHE have worked together to develop a sound methodology for this pre-distribution which EDF Energy now accept as an example of good practice.

It is probable future nuclear sites will have significant population within their counter-measure zones and PHE advocate the methodology currently practiced in Cumbria and Lancashire.

P-7

ARCOPOL - Enhancing Shoreline Response to Maritime Incidents

Mr Paul Harold¹

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Introduction

As maritime transport of chemicals continues to rise globally, and in view of the potentially catastrophic impact from maritime incidents, the need for effective planning remains a major consideration for environmental and public health protection.

Whilst there are limited data on public health impacts from maritime incidents (1) many incidents such as the Cason, the Napoli and the Flaminia illustrate the potential for harm to health (2).

To aid preparedness Public Health England Centre for Radiation Chemical and Environmental Hazards Wales has been involved in a maritime project called ARCOPOL (Atlantic Region Coastal Pollution Response).

Key objectives of the project have been to develop a range of freely available tools and guides for incident preparedness and to disseminate these to stakeholders across Europe.

Methods

Three workshops were held across the European Atlantic Region each comprising 1 day stand-alone events combining interactive incident management presentations with desk top exercises.

Results

Workshops were well attended by a range of emergency planning and response agencies. Delegate feedback was very positive with results identifying raised awareness of ARCOPOL resources and the usefulness of networking opportunities to identify areas for improvement around maritime incident planning.

Conclusion

Workshops effectively illustrated the range of resources available from Arcopol and their application for maritime response. Furthermore, workshops highlighted the importance of multiagency exercises and their role in preparedness.

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P-8

“A gas leak, who cares?” ... Lessons learned from a domestic gas leak in Lothian, Scotland

[Miss Jenni Strachan](#)¹, Richard Othieno¹, Lorna Willocks¹, Colin Ramsay², Christine Evans¹, Louise Wellington¹, Josie Murray¹

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Background

High pressure domestic gas leaks are common in the UK but do not always cause significant risk to public health. Despite this, public perception of risk to their health and the prolonged nature of such incidents require an effective multiagency response. Temperature inversion occurring during a prolonged gas leak can have an adverse impact on public health. Temperature inversion causes air pollutants to be trapped close to the ground creating smog.

In January 2016 a fracture in a high pressure pipeline serving 32,000 residents was reported from a pumping station in Midlothian. The plume of gas travelled vertically into the atmosphere therefore

causing very limited exposure locally but later temperature inversion created a potential for public health risk.

Methods

We reviewed key documents relating to the incident including emails, Incident Management Team minutes, CHEMETS, situation reports, HP Zone and relevant literature in order to extrapolate the lessons learnt and reflect on the effectiveness of the multiagency response.

Results

A multiagency and internal debrief took place followed the incident and lessons were learnt. In particular, ground gas monitoring and CHEMETS allowed agencies to analyse the change in risk posed by a temperature inversion and formulate an action plan, including risk communication to the public.

Conclusions

Temperature inversion can increase the negative health consequences of a gas leak. Rigorous environmental monitoring and dynamic risk assessment are crucial in determining public health action, particularly where the gas leak is prolonged.

P-9

WEDINOS: findings on the who, where and what of new psychoactive substance use

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Background

WEDINOS provides direct access to testing and dissemination of information to reduce harms related to new psychoactive substance

5 Nations Health Protection Conference

(NPS) use. Individuals may submit samples for testing alongside an 'effects record' comprising basic demographic data, history of use, expected effects from the particular sample submitted and description of the unexpected/adverse effects experienced following consumption.

Method

Samples may be submitted anonymously via health / support services including substance misuse services, pharmacies and emergency departments using the WEDINOS 'sample and effects packs'. Alternatively, individuals may download the 'effects record' from the website www.wedinos.org and submit the sample independently. Test results and 'effects record' data are collated and findings disseminated back via the website and quarterly bulletin.

Results

Between project launch (1st September 2013) and 30th September 2015, 3,219 samples of substances were submitted and tested, 76% complete with 'effects record'. 85% of sample providers were male, and mean age of 31 years (range 14 – 68 years). 305 unique substances were identified, either in isolation or combination. Overall 14% of all psychoactive substances identified were synthetic cannabinoid receptor agonists and 23% analysed as cathinones / amphetamine-like compounds. Of those purchased as 'legal highs', a proportion contained controlled drugs; and vice versa samples purchased as controlled drugs contained substances not currently controlled.

Conclusions

Providing direct access submission of samples and self-report 'effects records' allows capture of reliable evidence based local and national trend data and targeting of specific subpopulations of NPS users for relevant pragmatic harm reduction interventions.

P-10

Following the LEADR: creating an innovative data linkage environment to analyse the antecedents of alcohol deaths

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Introduction

There were 459 deaths in Wales in 2014 where alcohol was recorded as the underlying cause: 3 per cent of all deaths in Wales. In addition to these alcohol specific deaths, there is considerable evidence that alcohol is involved in a substantially greater number of deaths, but that this involvement varies considerably by age, gender and social circumstances.

The ability to link deaths involving alcohol to other healthcare datasets, including hospital records and engagement with treatment services, supports analysis of the similarities and differences between different individuals in terms of their interactions with healthcare and treatment of individuals. Such a linkage would also potentially enable the identification of common points in the lifecourse where intervention may be effective.

Method

With support from the NHS Wales Informatics Service, the Substance Misuse Programme in Health Protection created the Linked Environment for Alcohol Deaths Research (LEADR). This environment supports the linking of records for alcohol deaths with admitted patient data, emergency data, critical care data, outpatient data and treatment data.

Results

Initial analysis will be published at the end of March 2016.

Discussion

The LEADR project represents an advance on the static, closed database extracts which are still often used for analysis of data gathered from multiple sources. It is a dynamic and flexible environment that leverages 'big data' to support analysis of a rich and continually updated stream of data, with opportunities to include relevant datasets from outside healthcare settings.

P-11

MERS-CoV Surveillance in the UK

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Since the MERS-CoV outbreak started in September 2012 with the first confirmed case reported to WHO from the UK, the enhanced MERS-CoV surveillance system has been established in the UK. Methods: Data were collated in the enhanced MERS-CoV surveillance database from laboratory test results reported to DataMart system along with data reported from local health protection teams about possible cases using a form. Descriptive analysis was carried out. Results: To date, 961 samples have been tested and reported to the DataMart system from England. 700 unique patients have been investigated for possible MERS-CoV infection in the UK and four were confirmed cases reported to WHO. Among 700 patients investigated, 56% were males, 41% were females and 3% gender unknown. The most common age group was the 45-64 years old (41%), followed by the 15-44 years old (28%) and the 65+ (24%). The number of patients investigated increased year on year from 35 in 2012 (Sep-Dec 2012), 102 in 2013, 149 in 2014, 266 in 2015 and 53 by 18th February 2016. The most common month observed overall for MERS investigation was October,

coinciding with The Hajj. Foreign travel information was available from 348 patients; most returned to the UK from Saudi Arabia (49%) and UAE (25%). Regional variations of patient distribution were also observed. The most commonly detected cause of the illness was influenza (53%). Conclusion: The enhanced MERS-CoV surveillance is an important tool in monitoring/response to this outbreak and provides key information in risk assessment and policy making process.

P-12

TB Cohort Review: Making it purposeful in Yorkshire and the Humber

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Background: TB cohort review is a process of quality assurance and accountability that has previously been reported to improve outcomes and now forms an integral part of the 'Collaborative TB Strategy for England 2015 to 2020'. Implementation began across Yorkshire and the Humber at the end of 2012 and this evaluation took place in summer 2014. Since the evaluation, action plans have delivered changes to improve both data collection and process.

Methods: Data from the national ETS system was analysed along with regionally collected data which supplements the local TB cohort review process. An online survey was sent to all participants of local TB cohort reviews and thematic semi-structured interviews were undertaken with a purposive sample of key stakeholders.

Results: Staff generally supported the process and valued the contribution it can play to improving TB treatment and control. Clarity of data fields and definitions of standards needs improving to make more meaningful

5 Nations Health Protection Conference

comparisons of performance and to set new standards based on the effectiveness of the treatment systems, not just treatment outcomes. Data collection should be less arduous and more timely, with sufficient detail to make meaningful interpretations of performance standards and treatment outcomes despite a complex case mix of patients.

Conclusions: To be purposeful cohort reviews should identify areas for system improvement in TB treatment and control, backed by effective means for facilitating change in a timely manner, so that services can be supported and resourced to implement good practice.

P-13

The rise of *Escherichia coli* bacteraemia in Wales, a population-based genomic analysis

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Objectives

This study utilises whole genome sequencing (WGS) to identify temporal, geographic and genomic risk factors to determine the rise of *Escherichia coli* bacteraemia (ECB) in Wales.

Methods

Population-based prospective WGS study. Microbiology laboratories in Wales submitted all non-duplicate isolates of *E. coli* from blood cultures to the Specialist Antimicrobial Chemotherapy Unit (SACU) between April 2013 and June 2014 for WGS by Cardiff University. The dataset was linked to routine microbiological surveillance data to obtain isolate antimicrobial resistance (AMR)

profiles. Novel AMR profiles and profiles with phylogeography were characterised by polymerase chain reaction and 672 were selected for WGS based on their determined phylogenetic groups. 48 retrospective ECB samples collected between 2007 and 2012 for BSAC's Bacteraemia Resistance Surveillance Programme were also included.

Results

720 isolates were WGS for analysis. The population structure of the cohort is dominated by four key lineages, which are responsible for a disproportionate number of ECB episodes; MLST Sequence Types 131, 69, 95, and 73. These sequence types are distinct in their virulence and AMR profiles, and have previously been identified as the principal causes of ECB in other parts of the UK. The study identifies that antimicrobial resistance is variable between these MLST sequence types. The WGS information has been put into context using additional epidemiological data to identify risk factors associated with these key lineages.

Conclusions

This high-resolution data will provide a clear target for developing and deploying interventions to halt the rise of ECB in Wales.

P-14

30 day all- cause mortality post *Escherichia coli* bacteraemia in Wales, a population based cohort

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Objectives

Risk factors for all-cause mortality (ACM) within 30 days of developing *E. coli* bacteraemia (ECB) in Wales, a population based prospective cohort.

Methods

Consecutive ECB cases were collected over three months (Quarter 2, 2014). A web-based questionnaire captured potential risk factor data identified by structured literature review from laboratory, secondary and primary care data; collected by laboratory, infection prevention and control, and health protection teams- collaborating with general practices/ care homes. The dataset was linked to; routine microbiological data to obtain isolate antimicrobial sensitivity (AMR) profiles; the Welsh Demographic Service to obtain date of death. Risk factor analysis is underway.

Results

First episodes of ECB in Welsh residents were analysed (n=495). 18% (90) of ECB patients died within 30 days of the specimen date for a positive *E. coli* blood culture. The all-Wales ACM rate was 2.9 per 100,000 population (95% CI; 2.35- 3.59); ranging from 2.0 to 6.1 per 100,000 by Health Board. The ACM rate increased with age; from <1 per 100,000 population in the under 54 year age groups (95% CI; NS) to 40.1 in the over 85 year age group (95% CI; 27.25- 56.93). ACM also varied by case classification; 27% of HOHCAI cases died, 16% of COCAI, 12.5% of COHCAI. 70% of those that died had isolates resistant to at least one antimicrobial group.

Conclusions

Multidisciplinary data provides a comprehensive risk factor analysis of mortality 30 days post-ECB. This will inform an action plan to target the rise of ECB in Wales.

P-15

An outbreak of *Salmonella enterica* serotype Typhimurium linked to Penrith, Cumbria

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Our aim is to describe the management and findings of an outbreak of *Salmonella enterica* serotype Typhimurium linked to an outdoor food and cultural festival in Penrith, Cumbria, as well as the role of extensive investigations in enforcing food regulations.

We undertook a cohort study using a web-based questionnaire, which asked about potential food, animal and activity exposures. The association between illness and each variable was estimated using odds ratios (OR) and 95% confidence intervals (CI). All stool samples underwent routine testing and Multiple Locus Variable number tandem repeat Analysis (MLVA) was performed on all isolates. Environmental Health Officers inspected relevant premises, obtained detailed accounts of the hog roast cooking, and tried to pinpoint the source of the hog roast, with support from veterinary officers.

Symptoms of *Salmonella* infection were reported by 36 cases. Eighty-two people responded to the questionnaire. In univariable analysis and in multivariable model, cases were significantly more likely than non-cases to have consumed hog roast from the stall outside a named pub [OR: 11.07; 95% CI: 3.24-37.79]. Stool samples from 15 symptomatic cases tested positive for *S. Typhimurium*. All isolates returned an identical strain (MLVA profile 3-10-11-0-0211), confirming a single source of infection. Through a comparison with the national isolates library, this was confirmed

5 Nations Health Protection Conference

to be identical to that identified in a handful of previous pig-related Salmonella outbreaks. We recommend national guidance be developed for hog roasts and the suitability of equipment to ensure safe cooking and hot holding during service.

P-16

Escherichia Coli O157 in private water supply

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We aim to describe the management and recommendations from an outbreak of Verocytotoxin-producing Escherichia coli O157 linked to two adjacent holiday cottages in Cumbria, UK.

A total of 21 individuals, across three independent groups of holiday makers staying at the cottages in July/August 2015 reported symptoms of E. coli infection, including one Canadian resident planning to return home for work as a food handler. Due to this dispersion of individuals domestically and abroad, careful collaboration was needed between PHE centres across England, as well as NHS Highlands (Scotland).

Both cottages were served by a single spring-sourced private water supply (PWS). Samples from individuals and from the source water underwent routine testing and Multiple Locus Variable number tandem repeat Analysis (MLVA). All isolates returned an effectively identical strain: E. coli PT21/28 VT2, MLVA profile "9-2-15-6-8-3-8-6".

The cause of the outbreak was thought to be a combination of factors, including a change in land usage near the source from

sheep to cattle grazing, an underpowered UV filtration system, recent heavy rainfall, and local geology allowing some movement of sub-surface water. Control measures included updating the management plan of the PWS, upgrading equipment, and stipulating/restricting land usage near the source.

Important learning points were identified, including procedures to inform the Local Authority of changes in the circumstances of the PWS such as modifications to equipment or land use, recommendations on use of PWS risk assessments, and improving awareness of the different sampling and testing methods available and used by different agencies on PWSs.

P-17

An outbreak of Hepatitis A linked to a primary school in Telford, England in 2015.

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During January to June 2015, an outbreak of hepatitis A occurred in a community with very low background incidence. Two early cases were managed as a household cluster. An outbreak was declared on 17 April when four further cases were notified within two weeks with links to the local Primary school and a multiagency Outbreak Control Team was established. We describe the investigation and management of the outbreak.

Probable and confirmed cases were defined as persons with acute onset of clinically compatible symptoms (i.e. jaundice, fever, nausea, vomiting, etc.) ± laboratory confirmed Hepatitis A infection living in Telford from 01

December 2014.

Demographic, clinical & risk factor/exposure data including food histories were gathered using a standard questionnaire and analysed descriptively. Environmental health officers visited the school and food outlets to assess hygiene and food safety practices. Diagnostic microbiology was undertaken by the local laboratory and genotyping by the reference laboratory. The main control measure was mass hepatitis A vaccination at the school.

Eleven confirmed (91% genotype 1A) and three probable cases were identified as part of this outbreak. The epidemic curve suggested a propagated pattern of transmission. Five cases were pupils at the primary school and the remaining cases (adults) had close contact with the school. The uptake of vaccination was high (620 pupils (89.5%) and 127 staff (90.1%)).

Our investigation did not identify the source of infection for the earliest and subsequent cases but the epidemiology indicated transmission presumably from asymptomatic school children to adults within the community.

P-18

Water cooler talk: Use of open text responses to an online questionnaire in the investigation of a large norovirus outbreak at a call centre

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In July 2015, the Yorkshire and the Humber Health Protection Team were notified of 180 call centre employees with diarrhoea, vomiting and fever. We investigated to describe the extent and source of the outbreak and to implement control measures.

Cases were defined as individuals working between 17 and 22 July with symptoms of diarrhoea and/or vomiting. An anonymous Select Survey questionnaire, which included open text questions due to limited prior information, was e-mailed to all employees. We compared exposure information from cases with non-symptomatic persons working on the premises over the same time period by calculating relative risks (RR) and 95% confidence intervals (CI). Open text responses were coded into thematic groupings. Cases were asked to submit faecal samples for microbiological testing.

898 individuals completed the questionnaire, including 220 cases. 60.9% of cases reporting both vomiting and diarrhoea. Workers on the first floor (88.6% of cases) were 3.4 times (95% CI: 2.3-4.9) more likely to report illness than those working elsewhere and drinking from the first floor water cooler (73.2% of cases) was also associated with illness (RR=2.6, 95% CI: 2.1-3.5). Respondents reported concerns regarding cleaning, hand hygiene and mixing of clean and dirty cups at the water cooler. Three out of six faecal specimens tested positive for norovirus.

Epidemiological evidence suggested that this large outbreak arose through contamination at a water cooler and the shared first floor workspaces. Case statements prompted our recommendations to improve cleaning, provide training on hand hygiene and demarcate clean cups at the water cooler.

P-19

Diagnosing and Managing Hepatitis E Infections (HEV) in 2015: Audit of HEV case management in a Health Protection Team and a survey of HEV diagnostic procedures in local laboratories.

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Aim

UK Hepatitis E (HEV) notifications are increasing and guidelines on public health management were published in 2015. This project investigated the notification and management of HEV cases in one HPU.

Methods

All 21 HEV case notifications between Jan and April 2015 were audited. A local laboratory survey was conducted to understand HEV diagnostic and notification procedures: seven responded. Three criteria were selected for audit; (1) did the notification represent a confirmed HEV diagnosis (2) was an enhanced surveillance questionnaire completed and (3) was an information leaflet sent to the patient.

Results

66% of notifications were reference laboratory confirmation results. However local laboratory notifications were often presumptive. In 4 cases public health action was unnecessarily initiated before case confirmation: of 7 local laboratory notifications, only 2 required action. In all cases an enhanced questionnaire was completed but <33% were sent an information leaflet. All laboratories that responded to the survey sent samples for HEV testing to the reference laboratory, Colindale.

Conclusions

This study is small and results should be interpreted cautiously. However the audit identified problems with the electronic reporting system for laboratory results.

As a consequence the HPT procedures were changed to verify non-reference laboratory HEV notifications in order to avert unnecessary public health actions that may cause patient distress. The survey found that most local laboratories send samples to the reference laboratory for confirmation thus local notifications are less likely to represent an acute HEV case. HPTs should be sending patient information leaflets to confirmed acute HEV cases.

P-20

Management of a Large Community Outbreak of Hepatitis A in a Deprived Area of West Yorkshire October 2015

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We describe a large community outbreak of Hepatitis A occurring between August and October 2015. The outbreak occurred in a small, deprived, urban area of West Yorkshire. In total, 18 cases were associated with the outbreak; of these, eight cases were symptomatic and ten cases were detected on oral fluid testing of contacts. The eight symptomatic cases were all genotype 1A and were subsequently shown to be of identical genetic sequence. Epidemiological links were established between initial cases.

Cases comprised six adults and 12 children. The early epidemiology indicated that the majority of infections were most likely acquired during the school summer holiday period, with asymptomatic children playing together within this close-knit community facilitating transmission. Later in the outbreak five of the cases (including four primary school aged children) had most likely acquired their

infection in the period after school return.

The interventions to interrupt the transmission of infection included: hepatitis A alerting and awareness raising; promotion of hand washing; community vaccination sessions and vaccination sessions at two schools within the outbreak area. One of the community sessions involved the use of an outreach bus to deliver vaccination in order to overcome access issues. Over a seven-week period in excess of 1400 individuals received vaccination in relation to the outbreak.

We highlight the complexities of managing a community-focused outbreak within a deprived area that required a coordinated multiagency response. In addition, we discuss the various strategies employed to offer hepatitis A vaccination to those considered to be at risk.

P-21

An outbreak of hepatitis A associated with a childcare facility in Dublin, Ireland

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We report on an outbreak of hepatitis A associated with a childcare facility (CCF) in Dublin, Ireland. The first three cases identified, one a CCF attendee, occurred within one household. The notification of a fourth case in a second household associated with the CCF alerted public health to the possibility of transmission within the CCF.

A look-back exercise of hepatitis A cases in the previous six months identified the index case who had an epidemiological link to the CCF. On phylogenetic analysis, this case was genotypically identical to three of the outbreak-related cases, the only cases to have

undergone genotyping.

Outbreak control measures included; appropriate environmental investigations, the dissemination of hepatitis A and infection prevention information to over 120 CCF attendee households and 30 CCF staff, and the offer of hepatitis A vaccination to a total of 555 CCF contacts aged between 1 and 50 years, namely; CCF attendees, their household contacts and CCF staff. Deep cleaning was undertaken at the CCF and a staff infection prevention and control education session was delivered by public health staff. The source of infection was not identified.

Between January and July 2015, 12 symptomatic cases were associated with the outbreak. Seven cases occurred after the implementation of the control measures, three had not been vaccinated. Given the incubation period of hepatitis A, the four vaccinated cases were most likely already infected at time of vaccination. This outbreak highlights the challenges and public health resources required to control a large CCF-associated hepatitis A outbreak.

P-22

Vows and Vomiting: An Outbreak of Norovirus GI-6 following a Wedding in North West England

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5 Nations Health Protection Conference

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Following a wedding in August 2015, PHE North West were notified that many guests reported gastrointestinal symptoms. An outbreak investigation was undertaken to identify the source and implement appropriate control measures.

Stool samples from 2 symptomatic staff members and 8 symptomatic guests were tested. Environmental investigations were also undertaken. A web-based survey was used to establish guests' consumption of various food and drink items.

A case was defined as a guest with symptoms including vomiting or diarrhoea, with onset within 72 hours of the wedding. A cohort study was conducted using univariable and multivariable analysis.

Of 140 guests, 134 (95.7 %) were sent the survey, 113 (80.7%) responded and 70 (50%) met the case definition. All stool samples from staff and guests were positive for norovirus GI-6. One staff member was symptomatic 2 days before the wedding and was not appropriately excluded following symptom resolution. The other staff member was symptomatic at the wedding and was quarantined.

Following univariable and multivariable analysis, the model showed that consuming the ham hock starter was significantly associated with being a case (OR 24.1, 95% CI 2.68 – 216.03). No food samples were available. Environmental investigations found the caterer's temperature records were incomplete and the handwash basin was adjacent to the raw meat preparation area.

The investigation concluded that this was a food-associated outbreak of norovirus GI-6

likely due to contamination from an infected food handler. It highlights the importance of appropriate exclusion for symptomatic food handlers in the prevention of outbreaks.

P-23

Management of a Streptococcus pyogenes outbreak with macrolide resistance on an acute dementia unit

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Two cases of Group A streptococcal (GAS) infection linked to a mental health unit were reported to the Health Protection Team. The cases were on separate male and female wards. One patient with IGAS was admitted to the hospital and treated but subsequently died. Indirect transmission from the male patient to the female patient via shared blood pressure monitor was identified as the likely transmission route. Five further cases of GAS infection with the same antibiogram were reported from patients on the male ward with superficial wound infections over the next 12 days. Typing of isolates supported epidemiological suspicion of patient to patient transmission of *S. pyogenes* with emm ST11.0, on the ward.

No staff carriers were identified. Patients were elderly with severe dementia and a range of co-morbidities. Non-compliance with isolation, screening and appropriate antibiotics, posed particular challenges to outbreak control. In addition to enhanced infection control measures, outbreak decision pathways were developed in collaboration with the mental health team, local microbiologists and PHE reference laboratory experts. This aimed to support a Multi-Disciplinary Team in developing individual screening and treatment plans for each

patient, to as far as possible identify carriers and treat all patients within a defined time period.

No further IGAS cases or transmission of GAS to other wards was reported. A low threshold for swabbing superficial wound was maintained. Two further cases of GAS colonisation were detected and treated at 10 and 24 days after mass treatment completion. No further cases were detected on subsequent screening.

P-24

Outbreak of Panton-Valentine Leukocidin-associated Staphylococcus aureus (PVL-SA) skin infection linked to a diving club at a national sports centre; case management; environmental assessment and control measures

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Routine follow-up of a teenage child with microbiologically confirmed PVL-SA skin infection in January 2015 showed the child was a diver and that other children in the competitive club had had similar infections.

The club confirmed that 5-10 children and a coach had been affected, at least 2 children remained symptomatic and the latest case was a new onset, suggesting ongoing transmission.

Information was sent to all parents of children attending the diving school. A site visit was undertaken and an online questionnaire was sent to all parents to allow case finding and further elucidate risk factors for acquisition and transmission.

3 confirmed cases (all spa type t034 PVL-MSSA), 2 probable and 5 possible cases, with soft-tissue infection were identified in this outbreak. All confirmed and probable cases had onset in Spring 2014 except one, with onset in January 2015.

Ninety-nine questionnaires were completed (269 clients emailed). Whilst numbers of cases were too small to allow multivariable analysis, several likely routes of transmission were identified:

- Sharing of shammy (diving) towels
- Piling shammy towels at poolside
- Infrequent washing of shammy towels
- Shared equipment, e.g. harnesses in dry gym, with no cleaning between use.

Control measures centred on reducing spread of infection by improving cleaning in the dry gym and pool-side. Further infection control measures focussed on education around washing and personalisation of shammy towels.

Outcomes of the investigation were shared with the pool management team and diving club with a view to wider dissemination at national competitions.

P-25

Managing a community outbreak of Hepatitis A in Oldham: the tricky decision of mass vaccination versus conservative management

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A community outbreak of Hepatitis A occurred in Oldham between August 2015 and (on-going). There were a total of 19 cases, 17 linked to one of two extended family networks, with suspected person-to-person transmission. Individual cases and contacts were managed according to HPA guidelines. Three asymptomatic cases were identified using salivary testing, following discussion with CIDSC.

The outbreak was managed by a multi-agency OCT involving PHE HPT, press office and laboratory, Local Authority Public Health and District teams, local CCG and hospital trust. Control measures included:

- Awareness-raising of hepatitis A and infection control and prevention messages within:
 - o Local educational settings and the community (initially targeted to affected communities, then Oldham-wide, with pro-active press release).
 - o Health and social care services, to ensure early notification and public health advice.
- A push to ensure that all residents eligible for pre-exposure Hepatitis A vaccination were identified and vaccinated, with a priority focus on those with chronic liver disease.

- A conservative approach to post-exposure vaccination: concerted efforts to identify all household-type contacts for each case (taking an inclusive approach) and arrange vaccination for them where appropriate.

No school-based vaccination sessions were held as no cases were judged to have acquired or transmitted their infection in such settings.

Mass vaccination was considered in great depth early in the outbreak, but wasn't recommended due to: lack of a well-defined population, suspicion that community transmission had already been on-going for a number of months, and opportunity cost of such a resource-intensive control measure.

P-26

Estimating extra demand on health services from pregnant women returning to the UK from Zika-affected areas

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Zika virus is an emerging mosquito-borne infection. Since late 2015, there has been an outbreak of Zika virus in South America, and increases in neonatal microcephaly have been reported. All pregnant women who have travelled to a Zika-affected area should be offered a baseline ultrasound scan. Therefore health services should be prepared for increases in consultations from pregnant women who have travelled to affected areas. We estimate the possible impact on care in the UK and in Wales in 2016 by calculating the total of women at risk using the International Passenger Surveillance (IPS) dataset.

We estimate conceptions at risk in 2016 as the total number of visits (by year, average years or region of residence) × % of people aged

16-44 × % of female travellers × conception rate per 1,000, assuming that:

- 1) The conception rate for women aged 15-44 applies to those travelling to the affected areas,
- 2) The proportion overall visiting affected areas aged 15-44 applies to the proportion of women travelling in countries at risk of Zika virus,
- 3) A visit is a conception at risk (i.e. 1 visit puts all conceptions that year at risk; multiple visits constitute multiple conception risks).

We estimate that between 27,700 and 29,100 pregnant women will be returning to the UK from Zika-affected countries in 2016; 628 of whom will be returning to Wales.

Health services need to plan for these extra demands on services.

P-27

Determinants of delayed isolation for Ebola Virus Disease, Guinea 2014-2015

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WHO aims for cases of Ebola Virus Disease (EVD) to be hospitalised within 2 days of onset to prevent secondary transmission. We investigated the determinants of time to isolation to target interventions.

Using the Guinean case-database we extracted information on dates of onset, notification and isolation along with demographic and area attributes for all cases of EVD. Active areas were those with at least one case report in the previous month. We calculated the isolation delay (ID) between onset and isolation, excluding observations with missing or implausible dates. We compared mean ID across selected characteristics using the Kruskal-Wallis test. We constructed a multivariable linear regression model to examine all exposures.

Of the 2384 (78%) cases, ID ranged from 0-27 days (mean: 4.7 days; 95% CI 4.6-4.9, decreasing from 6.6 in 2014, Q1 to 3.3 in 2015, Q3). Mean ID was higher in males (5.0 vs 4.5, $p<0.001$), rural areas (4.8 vs 4.6, $p=0.03$), and in cases with travel or funeral attendance pre-onset (5.2 vs 4.3, $p<0.001$). ID was lower in children under 16 years of age (4.0 vs 4.9, $p<0.001$), in active areas (4.7 vs 6.4, $p=0.02$) and areas with 4 or more health centres (4.9 vs 4.3, $p<0.001$). In the multivariable model, age and male gender increased ID and active areas and healthcare centre numbers and later report date reduced ID.

ID halved over the outbreak period, demonstrating the successful efforts to find and isolate cases. Interventions targeting healthcare access, males, older people, those attending funerals and travelling should reduce isolation times.

5 Nations Health Protection Conference

P-28

Review of Respiratory Outbreaks in Care Homes in Northern Ireland, 2011-2015

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Introduction

Respiratory infections can cause significant morbidity and mortality in elderly populations. Care Home settings are at increased risk of large respiratory outbreaks due to increased transmission among individuals living in close proximity and the susceptibility of residents to more serious disease. Prompt investigation and implementation of control measures is vital to limit the impact.

This study describes the epidemiology of respiratory outbreaks in Care Homes and suggests recommendations for public health management.

Method

Data were collated and analysed on Care Home respiratory outbreak notifications from regional Health Protection surveillance systems between week 40 2011 and week 20 2015 (four influenza seasons).

Results

Overall, 95 respiratory outbreaks were reported in Care Homes; 70 (74%) were confirmed influenza. Influenza confirmed outbreaks were predominantly Flu A (H3) (89%). Fewer outbreaks were notified in seasons 2011/12 and 2013/14 (13 and 1 respectively) than in seasons 2012/13 and 2014/15 (38 and 43 respectively). The peak number of outbreaks occurred in week 9. Vaccination uptake in residents was consistently high. Mean attack rate was 29%, with a mean of 11 cases at the end of an outbreak.

Conclusions

Respiratory outbreaks in Care Homes are predominantly caused by influenza A (H3),

despite high vaccination uptake. Higher numbers of outbreaks are notified during seasons when influenza A(H3) predominantly circulates in the community. Significant morbidity and mortality is associated with Care Home outbreaks, resulting in significant workload for public health, primary care and Care Homes. Recommendations include increasing training, improving collaboration with primary care, and standardising laboratory testing.

P-29

Investigation of an apparent Legionnaires' disease cluster in Shropshire County, June to November 2015

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Shropshire County has an average annual rate of Legionnaires' disease of 0.14 per 100,000. In June 2015, a case was notified followed by three further cases over 7 days in September. A multi-agency incident management team (IMT) was established to investigate this

increase and agree control measures.

A case was defined as a person with a clinical diagnosis of pneumonia and microbiological confirmation of *L. pneumophila* infection with an onset date from 01 April 2015 and residing/visiting Shropshire County 14 days before onset.

Epidemiological data was gathered using a standard questionnaire and analysed descriptively. Local Authority & Health & Safety Executive reviewed maintenance records of potential exposure sites; and undertook sampling where indicated. Clinical and environmental samples were tested in local microbiology and PHE reference Laboratories.

Eight cases were identified during this investigation, all older adults, mostly male (75%) with underlying medical conditions (88%). Four lived within a six mile radius, whilst three others either visited or worked in this area with one travel-related case. All cases were positive for *L. pneumophila* sg1 and molecular typing on five cases found different strains. Microbiological tests of environmental samples from seven locations were negative for *L. pneumophila* except for a residential location with a hot-tub.

The IMT recommended a range of control measures including precautionary shock dosing of cooling towers; cleaning the hot-tub; and advice to domestic & commercial water system owners. Despite a comprehensive and prolonged investigation, no source could be found and the IMT concluded that this was a pseudo-outbreak.

P-30

Completeness of case ascertainment and mortality recording in Legionnaires' disease surveillance in England

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Introduction

Surveillance of Legionnaires' disease (LD) is undertaken in England to promptly identify clusters, facilitate investigations of potential exposures and prevent outbreaks; thereby requiring case ascertainment to be accurate and complete. Surveillance data also enables monitoring of LD-associated mortality. We present the findings of an audit in relation to these aspects of surveillance.

Methods

Field Epidemiology Services (FES) teams for North West (NW) England and West Midlands (WMids) collaborated with the national legionella surveillance team to audit the national enhanced legionella surveillance scheme (NELSS), undertaken for each calendar year between 2011 and 2013, inclusive. Eligible cases were confirmed cases, resident in one of these areas with onset of symptoms in the previous year.

FES teams identified eligible cases recorded locally but not reported to NELSS. Completeness of case ascertainment was calculated as the proportion of all cases identified locally and reported to NELSS.

Completeness of mortality status recording was calculated as the proportion of all cases in the participating area, with a 30 day mortality status reported.

5 Nations Health Protection Conference

Results

Between 2011-2013, there were 102 cases in the NW and 138 in the WMids. There were no locally recorded cases not already known to NELSS, equivalent to 100% completeness of case ascertainment.

Recording of 30 day mortality status increased from 8.1% and 0% in 2011 to 46.3% and 35.5% in 2013, for NW and WMids, respectively.

Discussion

NELSS has high case ascertainment but improvements are needed to increase reporting of 30 day mortality. New approaches to collecting this data may be required.

P-31

A complex legionella cluster; Public vs Private priorities

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Introduction

A community cluster of legionella associated with a 1920s private mansion type apartment building containing 211 flats across three blocks. The flats are privately owned, self-contained with predominantly elderly vulnerable population. The first resident case of legionella was positive on 11/08/2015, the second resident case 17/09/2015 and died on 29/9/2015. The third case was a

contracted plumber working on the site and tested positive on 24/11/2015. A large refurbishment programme including works on the system had been ongoing since April 2015.

Methods

Epidemiological and environmental investigations took place. All three cases tested positive on urinary antigen and standard surveillance risk assessments carried out to ascertain potential exposures. The apartment building was identified as a strong risk factor for each case.

Environmental water sampling found the system to be heavily colonized with unacceptable levels of legionella. Emergency remedial measures were advised due to the ongoing risk in a vulnerable population. Multiple components of risk mitigation and risk communication to residents required a multi-pronged expert led collaboration including scientists, Local Authority, Health Protection Team, Health and Safety Executive, specialist engineers and the private property limited company.

Conclusion

In this community cluster we describe the unique challenges and lessons learnt from managing this incident within a private residential setting, with complex operational and legal issues.

Independent advice and support from the incident team and engagement with stakeholders ensured public health priority in investigating this legionella cluster and reducing the on-going risk. There have been no further cases associated with these apartment buildings.

P-32

Interrupted time series analysis to assess the changing incidence of invasive pneumococcal disease in the north east of England during the pneumococcal conjugate vaccine era

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Background

In April 2010, the 13-valent pneumococcal conjugate vaccine (PCV13) replaced PCV7 in the UK childhood immunisation program. This study assessed the effects of this change in vaccine on the incidence of invasive pneumococcal disease (IPD) in the North East (NE) of England.

Methods

Data on cases of IPD reported to the NE Health Protection Unit between 1st April 2006 and 31st March 2013 were obtained from an IPD enhanced surveillance system. Interrupted time series analyses using negative binomial regression were performed to assess the impact of PCV13 introduction on changes in IPD incidence over time after adjusting for seasonality.

Results

Although the annual incidence of IPD in the NE decreased significantly from 12.3 to 8.7 cases per 100,000 population between 2006 and 2013, the overall rate of decline did not significantly change following the introduction of PCV13. However, the incidence of PCV13 serotypes not included in PCV7 was affected: following an increasing trend during the PCV7 era, a decreasing trend

was observed following the introduction of PCV13. Cases caused by PCV7-only serotypes continued to decline at the same rate, while the incidence of IPD caused by non-PCV13 serotypes continued to increase at the same rate.

Conclusion

Although the overall incidence of IPD in the NE has continued to decline following the introduction of PCV13, the rate of decline has been limited by continuing serotype replacement. Development of new vaccines and/or public health strategies are required to tackle the persistent burden of IPD in the NE.

P-33

Seasonal Flu Vaccine uptake in at risk population: Can we do better?

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While uptake for those aged 65 years and over for seasonal influenza immunization has consistently met the government 75% target, this target proved challenging for younger at risk patients. To support GP practices a self audit tool was developed by Pharmaceutical Public Health based on criteria previously identified as useful. A small pilot project was undertaken to assess the usefulness of this approach.

Sixty GP practices with uptake rates representative of Health Board were invited to participate, complete a self audit tool and participate in one to one interviews during May/June 2015. Practices received an individualized feedback report on their audit results and subsequently vaccine uptake rates to week ending 10 January were compared for 2014/15 and 2015/16 flu seasons.

Self audit was completed by 11 practices and

5 Nations Health Protection Conference

nine practice managers were interviewed. Overall compliance was reasonable, all of the practices complied with at least 70% of the criteria (range 58%-86%). Feedback reports identified the main areas for improvement included collaboration, sharing a report with practice team, learning from colleagues and involving stakeholders. Interviews identified that all participants believed the self audit and feedback was useful. Median vaccine uptake in intervention practices demonstrated no significant difference between seasons but a trend upwards, median 46.1% IQR 15.9% for 2014/15 compared to median 50.1% IQR 16.8% for 2015/16 ($p=0.248$). Matched control practices demonstrated a significant reduction in uptake from 48.8% IQR 15.1% 2014/15 to 41.6% IQR 18.1% 2015/16 ($p<0.001$).

This small pilot study demonstrated a new approach to encourage flu vaccine uptake.

P-34

A systematic evaluation of the representativeness of the diphtheria immunisation programme in East Java, Indonesia, June 2015

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In 2012, an outbreak of diphtheria caused 941 cases (37 deaths) in East Java province, Indonesia. The vaccination coverage of three doses of diphtheria-containing vaccine (DTP3) was estimated as 83% across Indonesia in 2012.

Despite commitment to the 2015 Global Vaccine Action Plan 90% DTP3 target coverage, estimated coverage had fallen to 78% in 2014.

Our evaluation aimed to assess the accuracy of vaccination coverage estimates and the

representativeness of data collected for the vaccination programme in East Java.

Semi-structured interviews were undertaken by UK FETP fellows with a range of pre-selected public health professionals at provincial, district and village levels. The immunisation information system was described and evaluated for representativeness by obtaining information on monitored target groups and the quality of immunisation records.

Vaccines were administered to children at monthly clinics, recorded, aggregated by the village midwife and then entered onto a web-based immunisation system for East Java by district staff. The proportion vaccinated was calculated by dividing doses given by expected number of surviving infants born that year. In 2014, 16 (42%) districts reported over 100% DTP3 coverage.

To meet targets, midwives also vaccinated and recorded children outside the target age group with previously missed vaccinations, and recorded already-vaccinated children moving into the area.

We believe targets are an acceptable motivational tool; however current data recording practices may lead to overestimation of childhood vaccination coverage.

We recommend that guidance on data reporting is developed to ensure only appropriate target age-group vaccinations are included in numerator data.

P-35

Annual point of delivery (POD) postnatal surveys of vaccine uptake in pregnancy conducted by Public Health Wales and the maternity services are able to demonstrate service improvement and development

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Surveys are used to monitor uptake of influenza and pertussis vaccines in pregnant women delivering in maternity units over a five day period each year. All the main maternity units in Wales participate and midwives administer questionnaires to mothers and return the data to Public Health Wales for analysis.

Influenza and pertussis present significant risks to pregnant women and their babies. A total of 36 pregnant women died from flu between 2009 and 2012 in the UK. More than half of the deaths occurred after the vaccine became available, none of the women were known to have been vaccinated. There have been 13 deaths in infants from pertussis since the vaccine programme began in 2012, of which 11 deaths were in babies born to unvaccinated women.

The surveys show that uptake of influenza vaccine in pregnant women increased each year: 61.6% (2012/13), 70.5% (2013/14) and 72.4% (2014/15). Coverage of pertussis vaccination remained stable from 2013/14 and 2014/15 at 69.0%.

It is important that midwives and GP's continue to support women to receive these vaccines and that uptake in this group is measured. These surveys help to inform decisions about the future of the programmes and service development such as further communications and training resources.

Results of the fourth POD survey will be

available before the conference. We believe Wales is the only country to have carried out repeated point of delivery surveys in the UK.

P-37

A GP cluster support scheme

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GP practices in Wales are allocated to local networks known as clusters which vary in size between 4 and 12 practices. To support the national influenza programme a pilot cluster support scheme was launched in September 2015. This aimed to:

- encourage and support cluster working to maximise flu vaccine uptake in eligible groups
- encourage innovation and peer support
- enable sharing of best practice and energise flu campaigns
- provide supporting documentation and resources.

Two clusters were recruited to the scheme and nominated a Cluster Flu Lead who was responsible for:

- presenting information about flu and flu vaccine uptake to clusters and individual practices throughout the season
- supporting practices to identify a Practice Flu Champion who was expected to demonstrate leadership and active support of the flu campaign
- supporting practices to integrate key factors that influence vaccine uptake into their campaign.

Mid season reports indicate the clusters are working proactively with their practices offering peer support, sharing best practice and practical tips and help. Across Wales there has been a decrease in flu vaccine

5 Nations Health Protection Conference

uptake however, when comparing current vaccine uptake with end of season uptake last year both clusters in the scheme have demonstrated an increased uptake in those aged 65 and over and also in under 65 year olds in risk groups.

End of season reports are expected from Cluster Flu Leads and Practice Flu Champions at the end of February, when more detail will become available.

P-38

Influenza e-learning for health and social care workers

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Frontline health and social care workers are actively encouraged to have annual flu vaccination to protect themselves and those they care for, however vaccine uptake in these groups remains suboptimal. Evidence indicates there are many reasons for this, with lack of awareness and understanding of the disease and vaccine common themes.

In an effort to raise awareness amongst healthcare staff a short interactive e-learning module for healthcare workers was developed in Wales (FluOne) and is modified and updated annually. Images and short videos are utilised throughout to keep the learner engaged, and allow learners to guide their learning as appropriate to them.

Since its launch in 2013, over 1,625 staff, from every health board and trust in Wales, have completed the module, with 927 completing it so far in the 2015/16 influenza season. User feedback on content and format has indicated it is accessible, easy to understand and informative.

Feedback also showed that FluOne content did not resonate, or meet the information needs, of social care workers and care home staff. The original FluOne was thus renamed FluOne(health), and a social care workers module, FluOne(social), was developed and launched in 2015, aimed at social care workers and care home staff.

Feedback from 572 individuals has demonstrated that after completing a FluOne module 95% considered themselves to know more about flu and the flu vaccine than before, with 86% indicating an intention to be vaccinated following the module.

So far 164 individuals have accessed FluOne(social) and feedback is currently being collected.

P-39

Working with the Third Sector to improve vaccine uptake

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Flu vaccine uptake is suboptimal in Wales across eligible groups. Third Sector frontline staff are in daily contact with the most vulnerable people in society and are ideally placed to raise awareness of annual flu vaccination in risk groups. Prior to the winter of 2015/16 Public Health Wales engaged an expert from the Third Sector to explore how this group of care providers could be better engaged in the annual influenza programme.

The aims were to:

- encourage and support Third Sector colleagues to influence flu vaccine uptake in eligible groups
- encourage innovation and peer support

- identify factors that help and enable a sharing of best practice

Engagement events were planned and facilitated with Third Sector organisations that supported individuals who were; carers, aged 65 and over, or had chronic liver disease.

A total of eight events were scheduled to coincide with existing meetings being held by the organisations. In total, 80 people, predominantly frontline workers, attended.

Despite workers, as a rule, having little intention of getting vaccinated themselves, in almost all cases, the engagement exercise had a positive effect on frontline staff agreement to providing information to clients and encouraging them to consider vaccination.

Prior to the engagement events, 58% of attendees intended to provide vaccine information, this rose to 85% post-engagement. Pre event, no intention to provide vaccination information was noted in 40%, but dropped to 15% after.

The challenges and pressures such as understaffing and lack of funding may be impactful on progressing this work.

P-40

Determining uptake of influenza vaccination in pregnant women: a comparison of automated data collection from General Practice and a survey of women at the point of delivery in maternity units

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Pregnant women are at a higher risk from influenza and are eligible for free influenza vaccination. Uptake is usually estimated using

electronically extracted GP data. Difficulties exist in ascertaining accurate pregnancy data from GP codes, potentially resulting in uptake underestimation. We compared uptake data from Point of Delivery (POD) surveys conducted in maternity units to electronically collected GP data, evaluating uptake underestimation and shortcomings in approaches.

Data were compared for three seasons. GP data were collected electronically using Audit+. POD surveys were undertaken by midwives in major maternity units for a five day period on women's recollection of flu vaccination.

Uptakes estimated using GP data were 43.6% (2012/2013), 43.7% (2013/14) and 45.5% (2014/15), uniformly lower than POD survey uptakes: 61.6%, 70.5% and 72.4% respectively. Discrepancies were also observed when comparing relative Health Board level data.

Given different sampling frames, it is unsurprising that uptake differed. POD surveys only include women whose pregnancies ended in live birth. Estimates of the proportion of pregnancies ending in termination or miscarriage vary, these have a shorter window of opportunity to be offered vaccination. However, there are concerns about robustness of data collected electronically from GPs, particularly in denominator ascertainment.

There are difficulties in using both techniques to estimate uptake in pregnant women. Development of data extraction from maternity service systems may provide a more robust measure. In the absence of this and given the uncertainties of automatically collected GP data we conclude that estimation using POD surveys is the most appropriate and useful approach.

5 Nations Health Protection Conference

P-41

An outbreak of measles in Hounslow, North West London, February 2015

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Introduction

There has been low uptake of Measles Mumps Rubella (MMR) vaccine in cohorts of children born between 1999-2003, associated with Andrew Wakefield's now discredited paper linking MMR vaccine with autism.

Outbreak identification

On 29th January 2015, a hospital clinician notified probable measles in a 14-year-old male, resident in Hounslow, London. The case was PCR-confirmed the next day. Active case finding of rash illness in the index case's school detected four associated cases. An outbreak control team (OCT) was convened on 3rd February.

OCT actions

- Information cascaded to: local General Practitioners (GPs), pharmacies, hospitals and Directors of Public Health; all Hounslow schools and childcare settings; London Health Protection Teams
- 21 day exclusion for unimmunised contacts of all confirmed and probable cases
- School immunisation sessions offered MMR to pupils incompletely immunised, or with unclear vaccination status, identified using the Child Health Information System.

Results

A total of 15 cases were notified (13 confirmed, two possible), age range 18 months to 15 years. Twelve of the confirmed cases were unimmunised with MMR, seven of whom were the siblings of earlier confirmed cases.

Discussion

Early recognition and prompt notification of measles are critical to outbreak control.

The number of unimmunised contacts that became confirmed cases demonstrates the high infectivity of measles, and justifies exclusion for the duration of the incubation period. The outbreak identified a significant number of children incompletely immunised with MMR. There is a responsibility on GP practices to recall all incompletely immunised persons under 16 for vaccination

P-42

Predictors of fatal outcome in patients admitted to paediatric intensive care units with pertussis

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Introduction

In England, pertussis incidence is highest among unvaccinated young infants.

The infection in infants carries a high risk of severe, life threatening illness but much is still unknown about its clinical course that results in paediatric intensive care units (PICU) admissions.

Methods

Public Health England undertook an audit of pertussis related deaths in 2011 and 2012 during a national outbreak. Risk factors for death were assessed by comparing fatal and non-fatal cases admitted to PICUs across England. Information was collected from case note reviews on clinical history and presentation at admission; treatment; complications; support received and maternal characteristics. Differences were compared by

Fisher exact test.

Results

Between 01/01/2011 and 31/12/2012 19 deaths were identified. Fatal cases were compared with 25 survivors admitted to the same PICUs. Fifty nine percent (n=26) of infants were female, and the predominant ethnicity was white [71.1% (n=27)]. The median age of infants at symptom onset was 4 weeks ranging from 1 to 37 weeks.

Only high leucocyte counts ($\geq 30,000$ ul), high lymphocyte counts ($\geq 20,000$ ul) on admission and pneumonia during PICU admission were statistically significantly associated with infant death [OR=4.4 (95% CI: 1.17-16.56), OR=3.19 (95% CI: 1.11-9.17) and OR= ∞ (95% CI: 2.07- ∞)] respectively.

Conclusion

High white blood cell, lymphocyte counts and pneumonia are important predictors of fatal outcome which is in agreement with what has been previously described in the literature. We have identified no additional action that could be recommended with a view to preventing future pertussis infant deaths. Maternal vaccination remains key.

P-43

Can Health Improvement Initiatives add value to a Vaccination Programme

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In 2013 the JCVI issued a statement recommending the extension of the seasonal flu vaccination programme to school aged Children. As a result the Scottish Childhood Flu Immunisation Programme was introduced in 2013-2014 as a pilot and progressively expanded into a full campaign offering all Primary school aged children the opportunity

to be vaccinated with a live attenuated intranasal vaccine. Many Scottish Boards opted to deliver the programme during school hours; however NHS Forth Valley with a population of approximately 23,000 eligible primary school aged children developed a dynamic out of hours service in the first 2 years of the programme with the majority of children vaccinated in nurse led weekend clinics. These clinics were accompanied by Health Improvement initiative provided by Home Energy Scotland, Clackmannan Energy Efficiency Team and Stop Smoking services.

However due to the poor uptake from the vaccine clinics the method of delivery of the childhood extension flu programme was altered in 2015-16 to an in-hours weekday programme. This new programme achieved a higher uptake but had no Health Improvement component accompanying the clinics.

This poster will compare the different methods of delivering this programme, looking at the uptake levels achieved relative to the recommendations from the JCVI, and also looking at the pros and cons of each programme and whether the value of a successful Health Improvement programme can offset a lower uptake from a vaccination programme. The Poster will also allow delegates to indicate which method they would highlight as the more successful.

P-44

An analysis of enquiries about the new MenB vaccination programme received by the Thames Valley immunisation advice service, VACCsline.

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Background

4CMenB (Bexsero®) was introduced into the UK routine childhood schedule on 01.09.2015 to give protection against MenB. Two primary dose schedules were introduced; the routine schedule at 2 and 4 months of age for babies born on or after 01.07.15, and a catch-up programme for those infants born between 01.05.15 and 30.06.15. Local teaching sessions had been held prior to the introduction, and national guidance was available.

Enquiries received by VACCsline, a regional immunisation advice line, about the MenB programme were analysed to evaluate understanding of the new vaccination programme and inform future training.

Method

All enquiries about MenB received between 01.07.15 and 17.02.16 were analysed and grouped into categories based on the main theme of the query.

Results: 155 of 1188 (13%) enquiries were about the MenB vaccination programme. 58 (37%) were general administration queries, with 19 (33%) of those about the catch-up programme. 45 (29%) were enquiries about private vaccinations or vaccinating ineligible children. 16 (10%) reported errors with 9 (56%) of those administering a 12 month booster dose to ineligible children. 5 enquiries were about incorrect advice from neonatal/paediatric units

Discussion

The range of calls regarding MenB indicates

that professionals require ongoing training/support, particularly when communicating with parents of children born outside the eligible cohort and when managing the non-routine schedule. Attention should be given to acute trust staff as they may not be aware of current guidance. The 12 month dose errors were reported to the National Team and further guidance sent out.

P-45

Increasing seasonal influenza vaccination uptake among adults in clinical risk-groups: perspective of patients in Wales

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Despite improvements in seasonal influenza vaccine uptake rates over recent years, there remains considerable variation in uptake across Wales' health boards and among patients in different clinical risk groups.

With a view to informing planning of initiatives for the 2015-16 flu season, we investigated vaccination uptake rates and factors facilitating or impeding vaccine uptake among individuals in one such clinical risk group. We undertook a survey among adults attending general respiratory out-patient clinic appointments in hospitals throughout Wales between 15-26 June 2015.

One hundred and ninety six people (76 males, 109 females, 11 not recorded) with a mean age of 66.6 years (range 22-99 years) participated in the survey.

Among this specific patient group, awareness of eligibility to receive free influenza vaccination was high (90%). Eighty three percent of surveyed patients reported being vaccinated during the 2014-15 flu season. The vast majority were vaccinated by Practice

Nurses in the primary care setting, but only just over half of patients (53%) recalled receiving an invitation from their GP.

Scepticism in vaccine efficacy related to health literacy and health beliefs was evident.

Patients emphasised the importance of provision of tailored relevant information, and accessible clinics/appointments in locations outside of the GP surgery and at times convenient for the patient.

The already high vaccination uptake in these respiratory patients suggests that flu vaccination clinics within a hospital out-patient setting may not improve their uptake, but could facilitate opportunistic vaccination of harder-to-reach at-risk people (e.g. patients with liver disease)

P-46

HPV Vaccine uptake in the schools immunisation programme: do school characteristics matter?

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Background

HPV vaccine is given to girls in first year of secondary school by school immunisation teams in 32 Local Health Offices (LHOs)* around Ireland. Vaccine uptake for 2013/2014 was 84.4%, exceeding the target of 80% of the Health Information and Quality Authority (HIQA). Uptake varies between individual schools and between LHOs where uptake ranges from 61% to 90%.

Aims and Objectives

To determine if school characteristics (ethos, mixed/girls only and deprivation) are associated with HPV vaccine uptake.

Methods

The Schools Immunisation System (SIS) was

searched to generate a report of HPV vaccine uptake in schools nationally for 2013/2014. Schools for students with intellectual disabilities were excluded from analysis. DEIS (Delivering Equality of Opportunity in Schools) status and school ethos of each school (from the Department of Education and Skills website) was added to the report. Analysis was with IBM SPSS.

Results

577 schools were identified. Mean HPV Vaccine uptake was 83.7%. No difference was found in % uptake between girls-only or mixed schools or between schools of different ethos. DEIS schools had a lower % vaccine uptake than non-DEIS schools (79.4% Vs. 85.0%, $P < 0.001$). 83% of schools with HPV vaccine uptake $\leq 50\%$ were DEIS.

Conclusions and recommendations

DEIS school status is associated with lower % vaccine uptake. Further research is needed into factors associated with HPV vaccine uptake in Irish schools. Developing stronger links between vaccination teams and schools may help to increase uptake.

P-47

How good is the new Rotavirus vaccine: initial results of uptake and impact on laboratory confirmed cases in Anglia and Essex, United Kingdom, July 2015

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Rotavirus gastroenteritis accounts for an estimated 13,000 hospitalisations in under-fives each year in England and Wales. An oral live attenuated rotavirus vaccine (Rotarix®) was introduced into the UK

5 Nations Health Protection Conference

infant immunisation programme as a two dose schedule at 2 and 3 months of age, in July 2013. We collected vaccination uptake from October 2013 to March 2015 and laboratory confirmed cases data from January 2004 to May 2015. We compared the vaccine uptake rates and laboratory confirmed cases to provide evidence of vaccination impact. Between February 2014 and March 2015 vaccine uptake was 90–92% for two doses each month. Laboratory reported case numbers decreased by 82% in the post vaccination seasons. The mean cases numbers reported in weeks 1–22 for 2004–2013 was 1,318. For the same period, 256 and 226 cases were reported in 2014 and 2015 respectively. There was an 89% reduction in the first five months 2014 (59 cases compared to a mean of 537 cases in the equivalent period for 2004–13) in those under 1 yr who would have been directly affected by vaccination. Initially data suggests a 92% reduction in 2015 compared to the same pre-vaccination periods. For those aged 1 to <5 years a reduction of 75% was also evident in 2014 and 77% in 2015, suggesting indirect protection in this group. In conclusion, initial results following the introduction of the Rotavirus vaccine clearly indicates a very good uptake of the vaccine and a significant reduction in the numbers of laboratory confirmed cases.

P-48

Why are medical and military staff resistance to vaccination

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Background

Compliance rates of vaccination among health

care workers (HCWs) are historically low and had been conflicting. Although vaccines are available, prevalence of some of infections not changed and some increased per year in Saudi Arabia, effectiveness of immunisation programme and the vaccine compliance barriers could be contributing factors and require further depth investigation.

This study aimed to gain an in depth understanding of the reasons why some of HCWs and military soldiers are reluctant to get vaccinated and understand more about their awareness about communicable disease and preventive measures in work sitting.

Methods

A qualitative research through focus groups' discussion with newly recruited employee in 2014–2015 and in depth interviews among immunisation services team were conducted based on topic lists and semi-structured interview guides.

Results

Data were transcribed verbatim and thematic content analysis techniques with grounded theory approach has been used in identifying, analysing, and reporting on themes and subthemes.

The main themes emerged from the data regarding vaccine none compliance: vaccine related such as side effects of vaccines and painful vaccination; Personal related such as lack of knowledge and busy schedule; Organisation related such as lack of motivation and no reminder system ; social media related such as vaccine rumours.

Conclusions

This study reveals a deeper understanding of the behaviour and decision-making to accept and reject a vaccine. Although numerous challenges are present in the health care and military setting, practice of infection prevention and control should mirror that performed in hospitals outside the combat zone whenever possible.

P-49

The challenges of managing an Influenza outbreak in an immigration removal centre (IRC)

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Background

Thames Valley Health Protection Team (HPT) became aware of an outbreak of Influenza by chance following the investigation of a contact of Mycoplasma pneumonia associated with an outbreak in Scotland. The detainee had been admitted to hospital with suspected Mycoplasma pneumonia and treated on clinical suspicion. Following discharge the case was followed up with the IRC healthcare team who reported many other detainees (approx. 250) with similar influenza like illness (ILI) which had been ongoing for the previous two weeks.

As the early symptoms for M.pneumonia infection are similar to influenza it was essential that the agent causing the outbreak was identified. Viral swabs were couriered to the IRC and taken from the suspect case and other symptomatic contacts presenting to healthcare. Two were confirmed Flu A H1N1, two Flu B.

The IRC held 280 however there was a very high turnover. Approx. 10% of new arrivals were in high risk groups and offered the flu vaccine. Approx. 40% of healthcare staff had ILI presenting staff resilience problems. No antivirals had been prescribed for treatment or prophylaxis until the HPT became aware of the outbreak and confirmed as Flu A.

Challenges identified:

High turnover (300 detainees in one month), movement from IRCs UK wide; poor record keeping of ILI cases and outbreak management; low uptake (~30%) of influenza vaccine in HCWs; accessing

antivirals in a timely manner; layout of the IRC and challenges in isolation/cohorting

These challenges were explored with the IRC and commissioners to inform future outbreak management.

5 Nations Health Protection Conference

SPEAKERS AND CHAIRS BIOGRAPHIES

Gillian Armstrong

Gillian is a specialist registrar in public health medicine working in the Public Health Agency in Northern Ireland. Gillian worked as a paediatric trainee in the UK and Australia prior to her career in public health.

Julie Arnott

Julie Arnott is a Masters in Public Health graduate from University College Cork, Ireland, working as the project manager/epidemiologist on the national E. coli bacteraemia project within the Welsh Healthcare Associated Infection programme in Public Health Wales. Julie was previously the community infection surveillance Information Analyst.

John Astbury

John Astbury is a Consultant in Health Protection, currently working at Public Health England, North West. John completed his training at University of Manchester, University of St Andrews, University Edinburgh and Salford University.

Professor Sir Mansel Aylward CB MD DSc FOM FPM HonFFPH FRCP

Professor Sir Mansel Aylward CB is Chair of Public Health Wales – an NHS Trust responsible for the delivery of public health services at national, local and community level in Wales. He is Director of the Centre for Psychosocial and Disability Research and Professor of Public Health Education at Cardiff University. He is also Chair of the Bevan Commission, an independent expert group to oversee NHS reforms in Wales and to provide expert advice to the Minister for Health and Social Services. In the 2010 Queen's New Year's Honours List he received a knighthood for services to health and healthcare. From 1996 to April 2005 he was Chief Medical Adviser,

Medical Director and Chief Scientist to the UK's Department for Work and Pensions and Chief Medical Adviser and Head of Profession at the Veterans' Agency, Ministry of Defence. He lives in Merthyr Tydfil, his home town, where, in 2013, he was made a Freeman of Merthyr Tydfil County Borough.

Jennifer Bishop

Jennifer Bishop is an Information Consultant in the statistics support team at HPS providing advice, analysis and statistical modelling across all areas of Health Protection.

Colette Bonner

Colette Bonner is working in the Department of Health and has lead responsibility for policy relating to the control of infectious diseases and public health emergency planning.

Rachel Chalmers

Rachel's background is in the microbiology and transmission of zoonotic, foodborne and waterborne diseases. Current research includes the molecular and sero-epidemiology of cryptosporidiosis, detection and risk assessment of gastrointestinal protozoa, and the long-term health effects of infection. Rachel has >100 scientific publications, and was made Honorary Professor in Swansea Medical School in 2013.

Abigail Collins

Abigail Collins is a final year public health registrar in Ireland. After medical training in London, she commenced paediatric training in the West of Scotland. An interest in public health developed and she subsequently started public health training in the East of England Deanery, transferring to Ireland from year 2 onwards.

Louise Coole

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

Rebecca Cordery

Rebecca became interested in public health whilst working in the field of dementia research, with the National Hospital for Neurology and Neurosurgery and Institute of Neurology, London. She has special interests now in immunisation and vaccine preventable diseases; blood borne viruses; invasive Group A streptococcal disease and healthcare associated infections.

Noel Craine

Dr Noel Craine works as a research scientist for Public Health Wales and is based in North Wales. Noel has been involved in research that informed the development of the blood borne viral hepatitis action plan for Wales and in the subsequent implementation of the plan. He is currently involved in a multi-centre trial of psychosocial interventions to reduce hepatitis C risk.

John Cuddihy

Dr. John Cuddihy is Director of Public Health in the HSE Southeast region of Ireland. He has worked in Hospital Medicine, General Practice and more recently in Public Health and in the Health Protection Surveillance Centre. He has special interests in chronic disease prevention and management, environmental health hazards and communicable disease control. His qualifications include a Masters in Public Health, Diploma in Management and a Higher Diploma in Leadership and Quality Improvement in Healthcare, as well as

Fellowship of the faculty of Public Health Medicine of the Royal College of Physicians of Ireland.

Gavin Dabrera

Gavin Dabrera is Interim Head of Legionella and Influenza Preparedness Response and Control at the National Infections Service, Public Health England, Colindale.

Sarah Doyle

Sarah Doyle (MB MRCPI MPH MFPHMI) is a Consultant in Public Health Medicine in the Department of Public Health in the South East of Ireland. She has a special interest in zoonoses, infectious intestinal disease, water and sexually transmitted infections.

Jake Dunning

Jake Dunning is a Consultant in Infectious Diseases at PHE and Deputy Director of High Consequence Infectious Diseases at NHS England. He's worked on a number of international outbreaks in clinical, research and public health capacities, including pandemic and avian influenza, MERS-CoV, and Ebola. Jake is involved in PHE's ongoing incident response for Zika virus.

Chris Emmerson

Chris Emmerson joined the Substance Misuse Programme in Public Health Wales as an Information Analyst Specialist in 2013, after many years working in frontline substance misuse and homelessness. Current projects include estimating the prevalence of problem drug use in Wales and developing innovative approaches to analysing alcohol death data.

5 Nations Health Protection Conference

Mark Evans

Dr. Mark Evans, MD, MRCP, DCH, DTM&H Trained in Infectious Diseases and Tropical Medicine in the UK - included SpR at Hospital Tropical Diseases, London, in Ghana and Saudi Arabia. Worked at DH (policy) for 3years, then as CCDC and Director SW (North) HPU and now with Emergency Response Department, PHE working on national and international projects.

Meirion Evans

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

Kirsty Foster

Kirsty Foster has worked as a Consultant in Health Protection in the North East of England since 2005. She has a particular interest in sexual health and HIV.

Patricia Garvey

Patricia Garvey is an EPIET fellow based at the Health Protection Surveillance Centre in Dublin. She has worked in the Gastroenteric team there for 13 years. She specialised in the epidemiology of VTEC, salmonellosis and cryptosporidiosis. She has a PhD in molecular microbiology and a Masters in Epidemiology.

Ceryl Harwood

Ceryl Harwood is a Public Health Registrar training in Yorkshire. She is currently completing her Master's in Public Health at the University of Leeds. She qualified from Leeds Medical School in 2000 and trained in neurology, before undertaking a neuroepidemiology PhD at Sheffield University, completed in January 2015.

Hazel Henderson

Hazel Henderson is a Consultant in Public Health who first specialised in adult health and health services, then more recently moved into Health Protection. Hazel's academic interests have been diverse, and have included investigating management of infectious diarrhoea in care homes, and need for cervical cancer screening in lesbians.

David L. Heymann

David L. Heymann is currently Chairman of the Board, Public Health England, Professor of Infectious Disease Epidemiology, London School of Hygiene and Tropical Medicine and head of the Centre on Global Health Security at Chatham House, London. Previously he was the WHO's Assistant Director-General for Health Security and Environment, and Representative of the Director-General for polio eradication. In 2009 he was appointed an honorary Commander of the Most Excellent Order of the British Empire (CBE) for service to global public health.

Sue Hodgson

For around 30 years, Sue has worked in Radiation Protection, initially researching the processes of deposition, clearance and uptake of inhaled radioactive materials. Since 2007, Sue has specialised in raising radon awareness through campaigns and also advises those with high radon levels about the risk and how to reduce them.

Gillian Holdsworth

Gillian Holdsworth is a consultant in public health in the public health directorate of Lambeth and Southwark councils. She is a Fellow of the Faculty of Public Health and programme director of SH:24 a new online sex and reproductive health service embedded within the local sexual health economy.

Eleanor Houlston

Eleanor is a Public Health Registrar in Yorkshire and Humber.

Simon Howard

Simon Howard is a Public Health Specialty Registrar working in the North East of England, due to complete training in October 2016. In addition to Public Health Specialty Training, Dr Howard was Editor-in-Chief of the CMO Annual Surveillance Report 2012, and writes on health and medical topics for Oxford Reference.

Clare Humphreys

Clare Humphreys joined the Thames Valley Health Protection Team in February 2015 as a consultant after training in Yorkshire and the Humber in Public Health. I lead on surveillance and gastrointestinal infections for Thames Valley and am Health Protection, Health and Justice lead for Public Health England South East.

Sarah Jones

Sarah Jones is a consultant in Environmental Health Protection with Public Health Wales. She has a special interest in injury prevention.

Philip Keel

Philip Keel is an Epidemiological Scientist working for the Immunisation, Hepatitis and Blood Safety Department of Public Health England. He has a jointly awarded MSc Veterinary Epidemiology from London School of Hygiene and Tropical Medicine/Royal Veterinary College. His portfolio of work includes Hepatitis b, Shingles, Varicella and Pertussis.

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.

Andrew Kibble

Andrew Kibble is Operations Manager at Public Health England's Centre for Radiation, Chemicals and Environmental Hazards (Wales) and works in a similar role for Public Health Wales. CRCE Wales provides expert advice and support to Public Health Wales and Welsh Government on chemical and radiation hazards.

Lorraine Lighton

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

Noëleen McFarland

Noëleen McFarland is a Consultant in Health Protection for Public Health England South East Centre based in Hampshire. She has worked for PHE since 2014 and has a particular interest in Emergency Preparedness Resilience and Response and influenza.

Janine Martin

Janine has a degree in Computing Science obtained from the University of Ulster and has been working in Health Protection for 5 years in an information based role. She is currently working as an Epidemiological Scientist in the HCAI Team.

Suzanna Mathew

Suzanna Mathew is a Consultant in Communicable Disease Control for Public Health England. She is also Director of Training for Curriculum and Assessment for the Faculty of Public Health.

5 Nations Health Protection Conference

Dilys Morgan MBE

Has had an interesting career alternating between medical research in rural Africa and UK public health. Dilys is Head of Emerging Infections and Zoonoses at Public Health England, London. She is also an honorary Professor at the London School of Hygiene and Tropical Medicine.

Gareth Morgan

Gareth Morgan is a Project Manager in Substance Misuse Programme Public Health Wales. He has extensive experience in the field of substance misuse particularly with young people and the homeless. His role includes management of the Harm Reduction Database Wales (HRD) in Needle Syringe Programmes, and Naloxone registries throughout Wales.

Kirsty Morrison

Kirsty Morrison has worked as a surveillance officer in an urban health board in Lothian Scotland since February 2015, having completed her MPH at the University of Edinburgh in 2014. Her academic interests include emerging zoonotic diseases.

Ebere Okereke

Ebere Okereke has been a consultant in communicable disease control in Yorkshire and Humber since 2002. Her interests are zoonoses, emerging infections, tuberculosis and international public health. She recently spent 9 months working Kenya strengthening public health capacity in the country. She is the current president of the Health Protection Society.

Emmanuel Okpo

Emmanuel Okpo is a Consultant in Public Health Medicine (Health Protection) at the National Health Service (NHS) Grampian. He has lead responsibility for gastrointestinal infections and zoonoses, emerging infections,

sexual health and blood borne viruses. His research interest includes infectious disease epidemiology, sexual and reproductive health.

Lynsey Patterson

Lynsey Patterson is a field epidemiology training programme fellow who coordinated the epidemiological response to the outbreak.

Vanessa Rew

Vanessa Rew (BN, Dip, MSc) is a Nurse Consultant with Public Health England. She has worked in communicable and non-communicable disease in the UK (NHS and PHE) and internationally (UN Refugee Agency and Commonwealth Secretariat). Vanessa has specialised vaccine-preventable diseases and immunisations, undertaking research and advocacy work with under-served communities.

Wendy Rice

Wendy Rice has worked as an analyst with FES East of England since October 2013. Prior to that, she was employed as a research coordinator and data specialist at the British Columbia Centre of Excellence for Women's Health in Vancouver, Canada.

Ceri Riley

Ceri Riley is an Environmental Public Health Scientist at PHE's Centre for Radiation, Chemical and Environmental Hazards. Here she focusses on public health risk assessments for acute and chronic environmental hazards. She is an experienced environmental regulator, a Chartered Environmentalist and Chartered Scientist with a masters in chemistry.

Roland Salmon

Roland Salmon was formerly the Director of Public Health Wales' Communicable Disease Surveillance Centre, in Cardiff, where he worked for over 20 years. He has a longstanding interest in food safety and

foodborne diseases, notably verotoxigenic E.coli O157 infections and spongiform encephalopathies. Currently, he is finishing a three year term on the board of the Food Standards Agency. He also chairs the Transmissible Spongiform Encephalopathies' Subgroup of the UK Government's Advisory Committee on Dangerous Pathogens (ACDP). He was involved for some years in the development of the European capacity to address infectious disease threats, including a role in the setting up of the European Programme for Intervention Epidemiology Training (EPIET). He is a member of the Management Board of the French National Institute for Public Health Surveillance ('Institut de Veille Sanitaire').

Charles Saunders

Charles Saunders is a former GP and has been a Consultant in Public Health Medicine (Communicable Disease & Environmental Health) at Fife NHS Board since 1995.

Robert Smith

Robert Smith is a Clinical Scientist, with a wide-ranging portfolio and interests including field investigation; leading on zoonoses and gastrointestinal infections for Public Health Wales CDSC.

Shelagh Snape

Shelagh Snape is a member of the Cumbria and Lancashire Health Protection Team who responded to the Avian Flu outbreak in July 2015.

Rhianwen Stiff

Rhianwen worked as a junior doctor in South Wales across a variety of acute adult medical specialities and within clinical genetics before joining Wales' Public Health Training Scheme in 2007. Appointed as CCDC in September 2015, she leads on new entrant issues and the provision of health protection training.

Katy Town

Katy Town is a Senior Surveillance Scientist for PHE's Gonococcal Resistance to Antimicrobials Surveillance Programme and is completing her PhD assessing whether whole genome sequencing of *Neisseria gonorrhoeae* can enrich our understanding of the factors facilitating rapid transmission of gonorrhoea through sexual networks.

Philip Veal

Philip Veal is a Consultant in Health Protection in Public Health Agency (Northern Ireland) and leads on gastrointestinal infections and healthcare associated infections. Prior to specialising in public health Philip worked as a General Practitioner

Leonora Weil

Leonora Weil is a Public Health Registrar currently working at the Department of Health and North West London Health Protection Team where she managed several outbreaks and was involved with the Collaborative tuberculosis strategy for England. She has published articles in academic journals, newspapers, magazines and written a medical textbook.

Adrian Wensley

Adrian Wensley is an epidemiological scientist with the Public Health England Field Epidemiology Service, based in Leeds. Adrian's areas of interest include vaccine preventable diseases and outbreak investigation.

Chris Whiteside

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

AUTHOR INDEX

A

Acreman, Dean	O-33, P-9	Amirthalingam, Gayatri	P-42, O-13
Adams, Belinda	O-29	Anderson , Charlotte	O-12
Afza, Musarrat	P-29, P-17	Andrews, Nick	P-42
Agha, Zahir	P-31	Armstrong, Gillian	O-18
Ahmed, Rehana	O-15	Arnott, Julie	O-35, P-13, P-14
Ahmed , Syed	P-33	Ashton, Philip	O-34
Aiyedun, Victor	O-9	Astbury, John	O-3, O-6, P-16, P-6
Allen, David James	P-22	Avis, Paul	P-16
Althaqafy, Majid	P-48		

B

Bagnall, Helen	P-17	Bradley, Jane	O-20
Balogun, Koye	P-17	Bray, Neil	P-17
Baraitser, Paula	O-24	Brenner, Gilly	P-12
Barnhouse, Stephanie	P-1	Brereton, Chris	P-1
Barrett, Tom	P-46	Brittain-Long, Robin	O-14
Bates, Geoff	O-33	Brown, Graham	P-37, P-39
Bedesha, Jill	O-29	Brown, Graham	P-38
Begum, Lipi	P-31	Browning, Fiona	O-14
Begum, Shabana	P-2	Browning, Roy	O-14
Bishop, Jennifer	O-16	Brunt, Huw	P-4, O-19, P-5
Bishop, Louise	P-24, O-29	Brunt, Huw	O-21
Black, Caroline	O-9	Burkitt, Andy	O-4
Bonner, Colette	O-27	Byers, Lynn	O-14
Bracebridge, Samantha	P-34	Bywater, Jean	P-24

C

Cabrey, Paul	O-18	Clifford, Kathleen	O-10
Callow, Paul	P-4, P-5, O-21	Coles , Suzanne	P-20
Cameron, Claire	O-14	Collins, Sam	P-29
Campbell, Helen	O-13	Collins, Abigail	O-8
Campbell, Helen	P-42	Connor, Thomas	P-13
Carlton, Louise	O-10	Coole, Louise	O-37
Carroll, Kevin	P-19	Coole, Louise	P-20
Casey, Ted	O-10	Corcoran, Brenda	P-46
Chalker, Vicki	P-29	Corcoran, Daniel	O-10
Chalmers, Rachel	O-6	Cordery, Rebecca	P-24, O-29
Chand, Meera	O-14	Corrigan, Helen	O-14
Chandler, Kathy	P-30	Cosgrove, Breda	O-10
Chantler, Tracey	O-15	Cottrell, Simon	P-35, P-40
Chapman, Kaye	P-32	Cox, Madeline	O-37
Chow, Yimmy	O-12, P-31	Crookshanks, Hilda	P-28
Clarke, Anna	P-46	Cushen, Rebecca	P-5

D

Dabrera, Gavin	P-30, P-11	Diallo, Boubacar	P-27
Dallat, Mary	O-23	Dias, Esther	P-24
Dalton, Andrew	P-29	Dillon, Annette	O-10
Davies, Patrick	P-42	Doherty, Lorraine	O-1
De Pinna, Elizabeth	P-15	Doyle, Sarah	O-26
De Sanzberro, Chloe	P-26	Duffin, Sharron	P-17
Deasy, Benvon	O-10	Duncan, John	O-13
Deberra, Gavin	P-31	Dunling-Hall, Sara	P-47
Decool, Elsa	P-27	Dziobon, Julie	P-23
Decraene, Valerie	P-15, P-16, P-22		

d

de Burgh, Jane	P-24
----------------	------

E

Edeghere, Obaghe	P-29, P-17	Emmett, Lynsey	P-3
Ellis, Joanna	P-11	Evans, Christine	P-8
Elson, Katherine	P-38	Evans, Mark	O-28
Elston, James	P-20	Evans, Meirion	O-35
Emmerson, Chris	O-32, P-10	Ewing, Judith	O-1

F

Fallon, Una	O-8	Formenty, Pierre	P-27
Fiefield, Diane	P-25	Foster, Kirsty	P-32
Flanagan, Lisa	P-25	Fox, Andrew	P-22
Fletcher, Jon	P-29	Friar, Stephen	O-14
Fletcher, Jonathan	P-17	Fry, Norman	O-13
Flynn, Elaine	P-25		

G

Gallagher, Naomh	P-28, O-18	Ghosn, Nada	P-27
Garcia, Alba	P-27	Goldstein, Ruth	P-17
Garvey, Patricia	O-10	Goodchild, Philip	O-12
Gelson, Will	P-3	Gorton, Russell	P-32, O-34
Gent, Mike	P-20	Graham, Adele	O-18
Geoghegan, Lourda	O-23	Griffiths, Richard	P-10

H

Hallihan, Nollaig	O-12	Hope, Vivian	O-33
Hams, Rebecca	O-9	Houlston, Eleanor	O-25
Haque, Enam	P-2	Houseman, Catherine	P-32
Harold, Paul	P-4, P-7	Howard, Simon	O-5
Harwood, Ceryl	O-4	Howe, Robin	O-35, P-13
Heginbothom, Maggie	O-35	Howroyd, Chris	O-24
Henderson, Hazel	O-31	Huckle, Edwin	P-4
Henderson, Michelle	O-5	Hughes, Gareth	P-34
Hewitson, Katy	O-14	Hughes, Gareth J	P-32
Hewitt, Kirsty	O-12	Hughes, Harriet	O-28

5 Nations Health Protection Conference

Hives, Morag	O-14	Humphreys, Clare	O-11, P-49
Hodgson, Sue	O-20	Hutchings, Alun	P-9
Holdsworth, Gillian	O-24	Hutin, Yvan	P-27

I

Ijaz, Samreen	O-30	Inns, Tom	P-22
Inns, Thomas	P-47, P-16	Irvine, Neil	O-1
Inns, Thomas	P-15	Iyanger, Nalini	O-15

J

Jackson, Sarah	O-18	Johnson, Jillian	P-28
James, Kristian	P-4, O-19	Johnson, Allan	P-31
Jansa, Josep	P-27	Johnston, Alan	O-26
Jessop, Lucy	O-1	Johnston, Jillian	O-1
John, Gareth	P-10	Johnstone, Rob	P-29
Johnson, Christopher	P-1	Jones, Sarah	P-4, O-19, P-5

K

Kalic, Kristina	O-14	Kelleher, Patrick	O-26
Kara, Edna	P-42	Kemp, Gavin	O-11
Karcher, AnneMarie	O-14	Kibble, Andrew	P-4, P-5, O-21
Kean, Joseph	O-33	King, Ruth	O-32
Kearns, Angela	P-24	Kliner, Merav	P-2
Keel, Philip	O-30	Knapper, Elizabeth	P-29
Keel, Philip	P-42	Kowalczyk, George	O-22
Keenan, Alex	O-17		

L

Lai, Sandra	P-31	Lewis, Richard	P-35
Lang, Sarah	P-44	Lighton, Loraine	P-25
Leith, Jayne	O-14	Litt, David	O-13
Leleux, Jennie	P-44, P-49	Liu, Andrew	P-15
Letley, Louise	O-15	Lomas, Elaine	P-15, P-16
Lewis, Heather	P-5, O-38	Loughrey, Anne	O-1
Lewis, Heather	O-19	Lyons, Marion	P-9
Lewis, Richard	P-40	Lyons, Ronan	O-35

M

Mackay, Andrew	P-24	McMenamin, Jim	O-14
Maguire, Helen	O-12	McNally, Richard	P-48
Maher, John	O-10	McVeigh, Jim	O-33
Mahon, Mairita	O-26	Mellor, Dominic	O-14
Makwana, Darshna	O-30	Meltzer, Margie	P-41
Mandal, Sema	O-30	Meredith, Nicola	P-37, P-38, P-39
Marchant, Elizabeth	P-24	Mifsud, Albert	P-24
Marlee, Damian	O-29	Migone, Chantal	P-46
Martin, Janine	O-23	Mikhail, Amy	O-34, P-27
McAuslane, Helen	P-18, O-4	Moir, Victoria	P-41
McCarthy, Jo	O-19	Morgan, Gareth	O-33
McColl, Neil	O-20	Morgan, Mari	P-13, P-14

McCormick, Jacquelyn O-11
 McFarland, Noeleen O-7
 McGovern, Elyce P-21
 McGovern , Elizabeth P-33
 McGowan, Anne P-35, P-40
 McIlvenny, Gerry O-23
 McKeown, Paul O-18

Morris, Caroline P-20
 Morrison, Kirsty O-2
 Mouldsdale, Hilary O-28
 Murdoch, Heather O-16
 Murphy, John O-10
 Murphy, Siobhan O-10
 Murray, Josie P-8

N

Naik, Falguni P-29, P-30
 Naik, Falguni P-31
 Neal, Keith P-24
 Needham, Stephanie P-31

Nicholls, Margot P-19
 Nixon, Grainne P-23
 Noelle-Vieu, Marie O-29
 Nugent, Chris P-28

O

O Connor, Maire P-21
 O Meara, Mary P-21
 O'Connor, Lois P-21
 Okereke, Ebere O-4
 Okpo, Emmanuel O-14

Olley, Matthew O-30
 ONeil, Patricia P-29
 O'Sullivan, Margaret O-10
 Othieno, Richard P-8
 Overstall, Antony O-32

P

Parcell, Benjamin O-14
 Parry, Glyn O-24
 Patel, Bharat P-31
 Patel, Bharat O-12
 Paterson, Pauline O-15
 Patterson, Lynsey O-1
 Pearce, Mark P-48
 Pebody, Richard P-11

Pegorie, Matt P-25
 Perry, Malorie P-40
 Platt, Katherine P-15, P-16
 Poole, Kristina P-2, O-22
 Powell, Clare P-38
 Prempeh, Henry P-43
 Pudner, Victoria O-20

R

Raimbault, Yannick O-28
 Ramnarayan, Padmanabhan P-42
 Ramsay, Colin P-8
 Rankin, Annette O-14
 Reacher, Mark P-3
 Reacher, Mark O-9
 Rehman, Yasmin P-29, P-30
 Reid, Amanda P-39
 Reid , Jennifer P-33
 Rew, Vanessa O-15
 Ribeiro, Sonia P-42, O-13
 Rice, Wendy O-9

Richards, Alison O-9
 Riddle, Mia P-9
 Riley, Ceri O-22
 Roach, Claire P-15
 Roberts, Isabel O-21
 Roberts, Richard P-35, P-40
 Roddick, Iain P-3
 Rossi, Maria K. O-14
 Rowell, Sam P-15, P-16
 Russell, David P-4
 Rutherford, Alistair P-25

S

Saavedra-Campos , Maria O-15
 Saidouni, Asma P-27

Smith, Josie O-33, P-9, O-32, P-10
 Smith, Katie P-22

5 Nations Health Protection Conference

Schinaia, Nicola	P-15, P-16, O-22	Smith, Robert	O-36, O-38
Shah, Anjila	P-22	Smith , Alyson	O-11
Shankar, Giri	P-47	Smith-Palmer, Alison	O-14
Shankar, Kavitha	P-25	Smithson, Richard	O-18
Sharp, Ashley	P-25	Snape, Shelagh	O-3, P-16, P-6
Sheehan, Maresa	O-26	Souster, Graham	P-31
Shryane, Theresa	P-25	Spiers, Rachel	O-23
Shute, Justin	O-30	Stevenson, Janet	O-2
Sinclair, Chantil	P-34	Stewardson , Andrea	P-6
Skirrow, Helen	P-19	Stiff, Rhianwen	O-38, P-45
Skirrow, Helen	O-24	Strachan, Jenni	P-8
Slaoui, Nabil	P-27	Stürup-Toft, Sunita	O-11
Smith, Heather	O-14		

T

Targett, Katherine	O-14	Trindall, Amy	P-47
Taylor, Chanice	P-29	Turner, Charles	O-28

U

Ulyatt, Laura	O-11	Utsi, Lara	O-37, P-18
Uriel, Alison	P-2		

V

Verlander , Neville	O-12		
---------------------	------	--	--

W

Waite, Thomas	P-34	Westwell, Andrew	P-9
Waldram, Alison	O-34	Wilkie, Bruce	O-14
Wallace, Lynn	O-16	Williams, Christopher	P-27
Walters, Angharad	O-35	Williams, Christopher J	P-26
Ward, Mary	P-21	Willocks, Lorna	P-8
Webster, Diana	O-14	Wilson, Anne	O-1
Weil, Leonora	O-12	Wilson, Deborah	P-32
Wellington, Louise	P-8	Wood, Tracey	P-49
Wensley, Adrain	P-20	Wooton, Mandy	P-13
Wensley, Adrian	O-37, O-4	Wright, Lauren	P-32

Z

Zaman, Shahaduz	P-48	Zochowski, Wendy J	O-36
Zhao, Hongxin	P-11		

NOTES

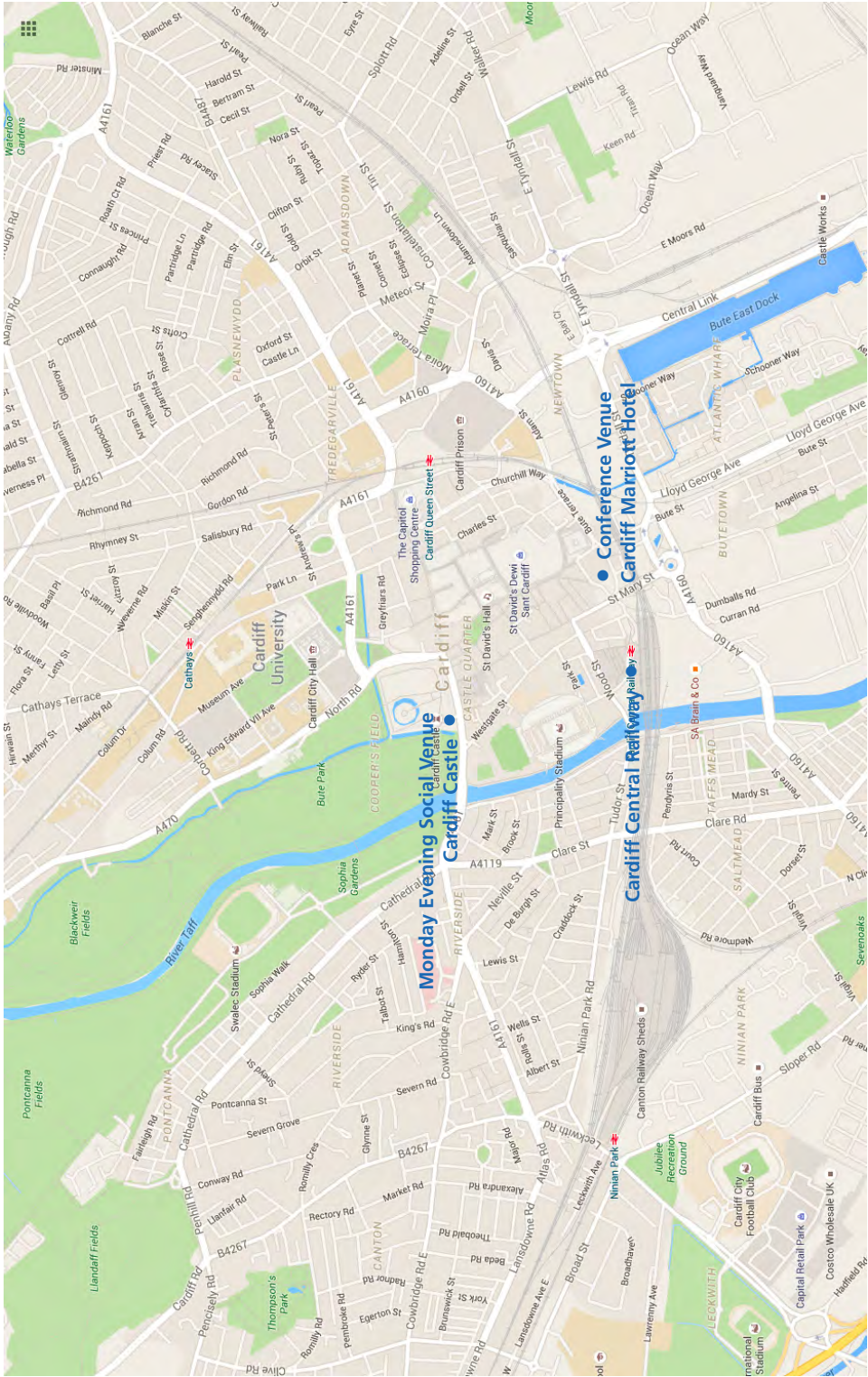
5 Nations Health Protection Conference

NOTES

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5 Nations Health Protection Conference

NOTES



Monday Evening Social Venue

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