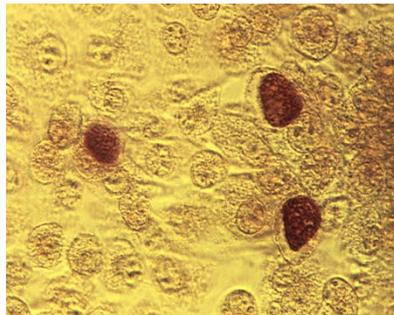




Public Health
England

Protecting the population of the North East from communicable disease and other hazards

Annual Report 2016/17



About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-class science, knowledge and intelligence, advocacy, partnership and the delivery of specialist services. We are an executive agency of the Department of Health, and are a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

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Foreword

Welcome to the seventh Annual Report produced by the North East Health Protection Team (HPT).

As in previous years this report summarises the activity of the various health protection functions of PHE. It also provides evidence to Directors of Public Health in support of their assurance role.

The North East Health Protection Team is in a transitional phase. Since the completion of last year's report Janet Robinson (Nurse Consultant) has retired, Jon Lawler (Senior Nurse) has joined the Public Health Training Scheme and Rosie Chapman (Nurse) has secured a job in school nursing. Dr Kirsty Foster is currently on secondment working with national colleagues at Colindale on sexual health and blood-borne viruses while at the same time providing local leadership on sexual health for PHE North East.

In addition, Karen Lloyd, our Regional Communications Manager for many years has retired and as mentioned in Section 1.3 below, Dr Russell Gorton retired in August 2017.

Dr Gayle Dolan joined us in September 2016, Dr Simon Howard continues to provide locum cover and Dr Peter Acheson returned from secondment with Stockton Borough Council. We have also recruited Rachael Kain and Claire Stoker to the vacant Senior Nurse positions and have recruited three health protection nurses/practitioners to the vacancies created by the changes outlined above. Julie Kinsella-Shenton has been appointed to replace Karen Lloyd and Dr Petra Manley has taken up post as the Field Epidemiologist in September 2017.

After many years of relative stability these are significant changes to the Health Protection Team. However, we are confident that the appointments we have made will ensure that the team continues to deliver safe and effective health protection services across the North East.

Summary of progress on 2016/17 priorities

The HPT identified seven local high-level priorities for 2016/17, as detailed in table F1.

Table F1: Summary of progress on 2016/17 objectives.

	Priorities	Outcome
1	Continue to deliver effective health protection services in 2015/16.	Achieved
2	Evaluate the impact of HIV home sampling intervention.	Achieved
3	Review the contribution of North East leads to the TB Control Board.	Achieved
4	Facilitate at least three 'cross-system' CPD sessions on TB, Health Protection for LA public health staff and 'Learning from incidents and outbreaks'.	Achieved
5	Develop a local AMR action plan.	Achieved
6	Continue the work with the EA and the FRS to develop risk assessments and information sheets for high risk fire sites.	Achieved
7	Produce health protection annual report for 2016/17	Achieved

Priorities for 2017/18

The first function of Public Health England (PHE) is to protect local populations from infectious diseases and other hazards to health. It does this at a national level through its national functions and at a local level through health protection teams (HPTs). PHE's high-level objectives for 2017/18 have remained the same for a number of years and therefore our objectives continue to be framed in the same way. They are:

Table F2: Local priorities for 2017/18

	Priorities
1	Continue to deliver effective health protection services in 2017/18.
2	Develop a North East TB Network vision statement and action plan to support the delivery of the national TB strategy.
3	Convene two meetings of the newly formed NETB Network.
4	Complete the work on developing a local AMR action plan and launch at a cross-system event.
5	Conduct mapping exercise to understand current local patterns of prescribing to ensure effective local action planning.
6	Conduct a review of EpiNorth3 (local health protection surveillance system)
7	Produce health protection annual report for 2017/18

1 Introduction

1.1 This report

This is the seventh Annual Report compiled by the North East Health Protection Team and outlines the key health protection issues in 2016/17 whilst identifying the priorities for 2017/18. It follows the format of last year's report in aligning the information with the four key components of health protection activity namely: prevention, surveillance, control and communication.

1.2 Health protection arrangements

Effective health protection is a collaborative activity across many different organisations and departments currently including local authority public health teams and environmental health departments, acute and mental health NHS Foundation Trusts, services within PHE regionally and nationally, NHS England, water companies, the Department for Environment Food and Rural Affairs (DEFRA), the Environment Agency, prisons, universities, clinical commissioning groups and the independent sector, particularly care homes. The success of health protection in the North East reflects the effective partnership working between all the agencies involved.

PHE delivers the following health protection functions in the North East:

- The North East Health Protection Team (NE HPT) delivers a 24/7 response to communicable disease incidents and other threats. The consultants and senior nurses work on a patch basis in hours: North of Tyne; South of Tyne and Wear; County Durham and Darlington; Tees.
- The Field Epidemiology Service (FES) collates information on communicable diseases from a wide variety of sources in order to give early warning of outbreaks, enable monitoring of interventions and trends and provide expert advice on epidemiological studies.
- Emergency preparedness, resilience and response functions support the NHS, the Local Health Resilience Partnership and the three multi-agency Local Resilience Forums in the North East in planning, exercising and responding (24/7) to a range of threats as part of a national team.
- The North East has a PHE communications team who are part of the national communications division and whose role includes the provision of proactive and reactive information on health protection issues.
- PHE provides specialist laboratory services located in Newcastle upon Tyne Hospitals NHS Foundation Trust. Food, Water and Environmental Services are delivered from the York Laboratory.

1.3 Field Epidemiology Services

Field Epidemiology Services North East is one of eight teams that are nationally managed and co-ordinated but geographically dispersed. Its purpose is to provide specialist epidemiological expertise to support Health Protection teams in field epidemiological investigations and surveillance.

In addition FES undertakes research and development of the evidence base for health protection to inform actions aimed at the control of infectious diseases and health effects from exposure to environmental hazards.

The North East FES office works very closely with the HPT; jointly managing North East based surveillance systems and providing epidemiological components of incident investigations, in particular analytic studies.

The most significant change in the FES Team has been the retirement of Dr Russell Gorton in September 2017. His departure will be a major loss to the health protection system in the North East and nationally. Russell's work in establishing and developing the team, setting standards in epidemiological practice and in system design will be greatly missed. Dr Petra Manley has been appointed to replace Russell and we welcome her to the North East.

1.4 The PHE Public Health Laboratory Service in Newcastle upon Tyne and York

The Microbiology Services Division of Public Health England provides clinical microbiology services (diagnostic and specialist microbiology), food, water and environmental microbiology to the NHS and to the community at large. For the North East, these specialist laboratory services are located in Newcastle upon Tyne Hospitals NHS Foundation Trust, and Food, Water and Environmental Services are delivered from the York Laboratory.

The laboratory works in close collaboration with the Newcastle upon Tyne Hospitals NHS Foundation Trust department of microbiology and operates a number of joint services, notably enteric microbiology. It is linked to the network of PHE specialised laboratories across England and to major reference units in Colindale (London) and PHE Microbiology Research Services (Porton). Two handbooks are available about the work of the laboratory:

Public Health Microbiology Services User Handbook
Clinical Microbiology Services User Handbook

The PHE Mycobacteria Reference Laboratory which had been previously located in Newcastle has now been consolidated within the PHE Laboratory in Birmingham. Since September 2017 all remaining PHE Laboratory services have been transferred to Newcastle Hospitals NHS Foundation with effect from 1st September 2017. The TB diagnostic services will remain largely unchanged, but the molecular diagnostic platforms will be different. Further details will follow in due course.

The provision of Public Health Microbiology Services (Laboratory and Professional support) will be put out to tender. Both Health Protection and Field Services have had input into the tender

content and will be involved in the process of awarding the tender. It is hoped that the tender will be effective from 1st April 2018. In the interim arrangements are currently under negotiation with Newcastle Hospitals to support the Public Health Microbiology Service.

Contact details for local laboratories are listed in Appendix 3.

1.5 Education and Training

The HPT and FES have a well-established track record in delivering teaching and training in a variety of settings. This includes formal support to the Public Health Training Scheme, delivering health protection elements of local post-graduate degrees in Public Health and supervised placements to a range of medical trainees. The HPT also contributes to training sessions at hospital trusts, local authorities and NHS England as well as formal presentations at conferences and seminars. Further details can be found in Section 10.

1.6 Delivering health protection

There are four key components to the work of PHE in protecting the health of the population in the North East: prevention; surveillance; control; communication. Other agencies have major roles in all these components. Each of these themes is the subject of separate section in this report.

2 Prevention – communicable disease

2.1 Immunisation and vaccine-preventable diseases

Immunisation remains one of the most effective public health interventions for protecting individuals and the community from serious diseases. The national routine childhood immunisation programme currently offers protection against 13 different vaccine-preventable infections. In addition to the routine childhood programme, selective vaccination is offered to individuals reaching a certain age or with underlying medical conditions or lifestyle risk factors

Programme delivery

NHS England is responsible for commissioning local immunisation programmes and accountable for ensuring local providers of services will deliver against the national service specification and meet agreed population uptake and coverage levels as specified in the Public Health Outcomes Framework and Key Performance Indicators.

- Screening and Immunisation Teams (SITs) employed by Public Health England centres and embedded in NHS England provide local leadership and support to providers in delivering improvements in quality and changes in the programmes. The SITs are also responsible for ensuring that accurate and timely data is available for monitoring vaccine uptake and coverage.
- Public Health England centres lead the response to disease outbreaks of vaccine-preventable disease and provide expert support and advice to the SITs.
- Local Authorities are responsible for providing independent scrutiny and challenging the arrangements of NHS England, PHE and providers.

A summary of current vaccination programmes in England is included in table 2.1. Following advice from the Joint Committee on Vaccination and Immunisation (JCVI) there have been some changes to the existing programmes of England's national immunisation programme for 2016/17:

Meningococcal B: Vaccination of babies against MenB will continue but paracetamol will no longer be centrally supplied and there will be no new catch up.

Pertussis: From the 1 April 2016, pregnant women have been offered the single dose of DTaP/IPV vaccine between gestational weeks 16 and 32 in every pregnancy.

Meningococcal ACWY: In addition to the routine programme opportunistic vaccination of 19-25-year-olds is currently taking place.

Meningococcal C: On the 1 July 2017, the 3-month scheduled MenC dose was removed from the childhood programme.

Table 2.1 Current vaccination programmes in England, June 2017

Programme	Organism/disease protected against
Routine programme Pre-school childhood programme (different components given on five occasions)	Diphtheria, tetanus, pertussis, polio, haemophilus influenza type b, pneumococcal disease, meningitis C, meningitis B, measles, mumps and rubella and rotavirus
Routine programme Annual for 2 to 6 year olds (and all children in school years 1 and 2 for winter 2016/17)	Seasonal influenza
Routine programme School-based programme	Booster – tetanus, diphtheria and polio and MenACWY
Routine programme School-based programme – girls only	Human papilloma virus (HPV)
At risk programme. Annual. Offered to all people over 65 and those in nationally defined clinical at-risk groups	Seasonal influenza
At risk programme. Offered to those over 65, usually on a one-off basis, and those in nationally defined clinical at-risk groups	Pneumococcal disease
At risk programme. Offered to all people aged 70	Shingles
At risk programme. Offered to all pregnant women who are 20 weeks pregnant	Pertussis (Whooping cough)
At risk programme. Offered to all pregnant women during flu season, at any stage of pregnancy	Seasonal influenza
At risk programme. Offered to babies of mothers found to have Hepatitis B as a result of the antenatal infectious diseases screening programme	Hepatitis B
At risk programme. Offered to babies with a parent or grandparent who was born in a country where the annual incidence of TB is 40/100,000 or greater	Tuberculosis
At risk programme. People in prison	Hepatitis B, other vaccines that are indicated due to health or lifestyle factors, and any missed components of the childhood programme

Coverage rates

Uptake in the North East for the routine childhood programme remain among the highest in England: In Quarter 4, 2016: (Jan–Mar17)

- By aged 12 months, 96% of children in the North East (93% in England) had received a full primary course of diphtheria, tetanus, pertussis, polio, haemophilus influenza type b vaccines. DTaP/IPV/Hib
- By 12 months, 90.1% (84.7%) had received meningitis C vaccine.
- By 24 months, 94.9% (91.2%) had received measles, mumps and rubella (MMR) vaccine (dose 1).
- By 5 years, 92.5% (87.4%) had received two doses of MMR.
- By 5 years, 92.4% (86.3%) had received diphtheria, tetanus, polio booster. (DTaP/IPV Booster)

The vaccination programme 2017/18

Further changes will be implemented in 2017/18:

Hepatitis B: From autumn 2017, all babies born on or after 1 August 2017 will be eligible for a hexavalent vaccine which includes hepatitis B (HepB) for their primary immunisations. This vaccine, called Infanrix hexa®, will replace the pentavalent infant vaccines Infanrix®-IPV+Hib and Pediacel®.

Childhood seasonal influenza: From Sept 2017 Four year olds are no longer included in this programme. They will be covered by the school programme.

2.2 Planning

The HPT works with local authorities, NHS organisations and a range of other agencies on a regular basis to develop and review plans for the prevention, surveillance and control of communicable disease. Much of this work is undertaken at a 'patch' level (North of Tyne, South of Tyne and Wear, County Durham and Darlington, and Tees) and increasingly at local authority level. Regular multi-agency meetings are held to share information, supported by a series of routine reports.

PHE staff also attend a wide range of NHS planning and monitoring meetings and clinical networks and lead or attend task groups on specific diseases (such as TB or sexually transmitted diseases) or specific settings (such as colleges, universities or prisons). More detail on some of these activities is provided in section 5.

The HPT works closely with NHS England Cumbria and North East on planning for a range of serious and major incidents, developing joint response plans. Further detail is provided in section 6.

3 Surveillance – communicable disease

3.1 Data flows

Effective surveillance systems are essential to identify trends in, and outbreaks of, communicable diseases and to monitor the outcome of control actions. The HPT uses information from a wide variety of sources including:

- Laboratory reports for a nationally determined list of organisms plus additional organisms agreed in the North East.
- Formal notifications of suspected infectious diseases from registered medical practitioners and informal notifications from a range of healthcare workers.
- Clinician reports of patients where urgent action may be needed to protect contacts.
- Genito-urinary medicine clinics providing anonymised details of cases of sexually transmitted infections (STIs).
- Hospital trusts on cases and incidents of healthcare associated infections (HCAIs).
- Local authorities providing results of investigations into diseases which may be foodborne and intelligence about cases and outbreaks, usually of suspected food poisoning.
- Prison healthcare staff reporting certain suspected diseases and possible outbreaks.
- Care homes reporting illness in residents or staff, usually cases of diarrhoea and/or vomiting, but also respiratory disease outbreaks or other infections.
- Reports from other settings such as schools and nurseries with concerns about possible outbreaks of flu-like illness, diarrhoea and/or vomiting, or illnesses with a rash.
- Results of investigations by the NE HPT.
- Other ad-hoc contacts.

Case reports from notifications, laboratory reports and other sources are risk assessed by HPT staff and public health action taken as indicated. All cases or incidents requiring public health action are entered on HPZone, the PHE case management system.

Laboratory-confirmed cases, notifications of infectious disease and reports of certain other suspected diseases of local public health interest are entered on EpiNorth3, the North East surveillance system, which is used for cluster and exceedance detection, trend analysis and routine and ad-hoc reporting. The outputs trigger and guide further investigations and assist in identifying outbreaks.

Appendix 1 provides a summary of the main communicable disease cases reported in North East residents in 2015 and Appendix 2 a summary of the surveillance information which is routinely provided to local authorities and other partner organisations.

Information is forwarded securely to national PHE surveillance systems for the production of national statistics and reports. PHE receives and processes identifiable personal information under specific legislation¹ and the notification of infectious diseases legislation.² All PHE staff

1 Regulation 3. The Health Service (Control of Patient Information) Regulations (2002)

2 Health Protection (Notification) Regulations 2010

have a contractual requirement to protect the confidentiality of this information which is the same as that applied to NHS staff.

3.2 Healthcare associated infection (HCAI) surveillance

In England, it is mandatory for hospital trusts to report on the HCAI Data Capture System all cases of blood stream infection caused by methicillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-sensitive *Staphylococcus aureus* (MSSA), *E. coli*, glycopeptide-resistant Enterococci (GRE) and infections with *C. difficile* (CDI). This is monitored by the local field epidemiology team who produce monthly reports. From April 2013 reports have been sent to local trusts, clinical commissioning groups and NHS England area teams. Other infections (which make up the majority) are reported on a voluntary basis e.g. hospital norovirus outbreaks.

Another health protection surveillance scheme is Surgical Site Infection, which helps hospitals monitor their own rates of post-surgical infection (mainly orthopaedic) and compare themselves with similar organisations.

Additionally, PHE, in collaboration with the Department of Health, runs the Resistance Alert System, which tells microbiologists in the NHS about new and emerging resistance problems and how far they have spread. Enhanced Carbapenamase producing Enterbacteriaceae (CPE) surveillance was introduced in 2015.

3.3 Surveillance of sexually transmitted infections (STIs)

PHE collates anonymised information from genito-urinary medicine/sexual health clinics and non-specialist service on the number of infections and sexual health screening tests and treatments and produces national annual reports on STI in June / July each year. The quality of data reported from the North East remains high.

PHE NE continues to produce quarterly and annual reports for in line with what was identified as useful by the review of stakeholder needs undertaken in 2014. These include locally produced reports, as well as the nationally produced annual local authority sexual and reproductive health profiles (LASERs) and the new Spotlight reports of STIs and HIV.

The GUMCAD2 system collects information on STI testing and diagnosis in GUM and non-specialist settings, including primary care. The HPT and FES team, together with the PHE NE Sexual Health facilitator (a shared post with Yorkshire and Humber), continue to work with local services to ensure completeness of reporting to this system.

3.4 Surveillance of invasive pneumococcal disease (IPD)

An enhanced invasive pneumococcal disease (IPD) surveillance system was established by the NE HPT in 2006 to investigate the epidemiology of IPD. This project is funded to the end of December 2018.

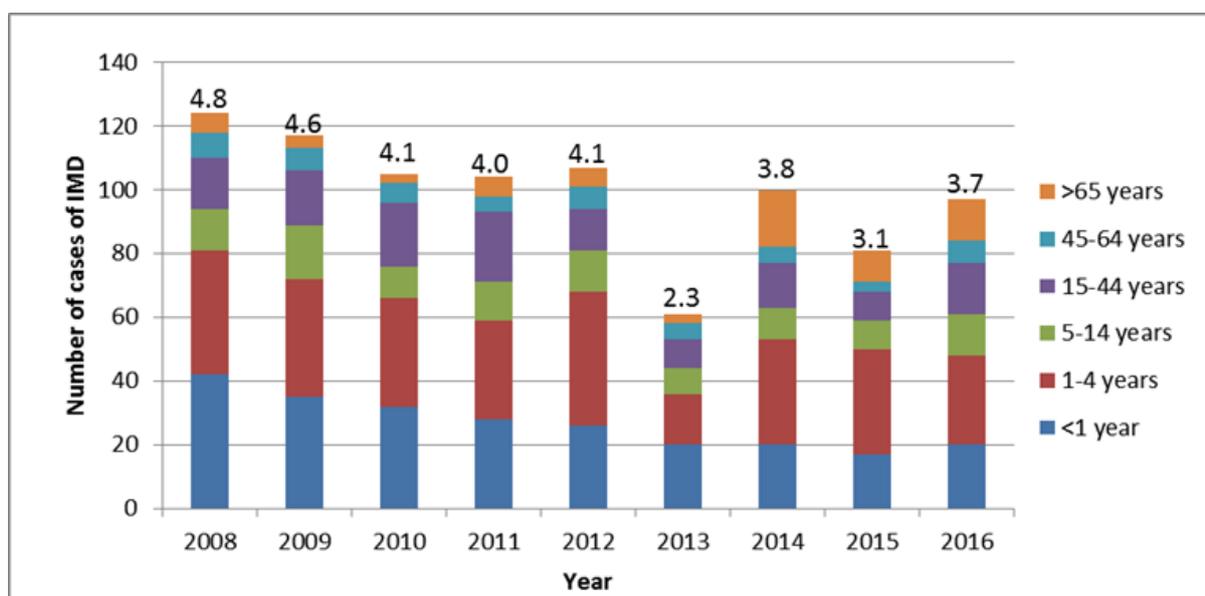
4 Control – specific diseases

Early diagnosis by clinicians, prompt treatment of cases and early reporting by microbiologists and clinicians to the NE HPT are essential in enabling prompt public health action for diseases such as meningococcal infection. For other diseases such as gastrointestinal infections, initial reporting may be through local authority environmental health officers.

4.1 Meningococcal meningitis and septicaemia

Meningococcal meningitis and septicaemia (blood poisoning) are serious illnesses that mainly occur in children and young adults and can sometimes cause long-term disability and death.

Figure 4.1 Number of cases of invasive meningococcal disease (IMD) in the North East by age group and overall rate from 2008 to 2016



The numbers above the bars show the overall rate of cases of IMD per 100,000 in the North East. Approximately 10% of adults carry meningococcal bacteria without developing illness. Meningococcal disease does not spread easily from person to person and is usually acquired from a very close contact that remains well. Cases of meningococcal disease can result in considerable anxiety.

HPT staff identify close contacts of each case to offer them advice, information and chemoprophylaxis (preventive antibiotics) if required. They also support schools, colleges, universities and workplaces where a student or staff member has been diagnosed with meningococcal disease. Linked cases and outbreaks of meningococcal disease are uncommon.

Table 4.1 Number and rate of cases of meningococcal disease by local authority for 2016

Local Authority	Number of cases	Rate (per 100,000)
County Durham	19	3.7
Darlington	3	2.8
Gateshead	10	5.0
Hartlepool	5	5.4
Middlesbrough	6	4.3
Newcastle upon Tyne	15	5.1
North Tyneside	4	2.0
Northumberland	13	4.1
Redcar and Cleveland	4	3.0
South Tyneside	4	2.7
Stockton-on-Tees	4	2.1
Sunderland	9	3.2
North East Total	96	3.7

*Rate uses local authority population figures for 2015

Meningococcal disease in the UK due to serogroup group C has reduced significantly since the introduction of group C vaccine in 2006. Serogroup group B now accounts for the majority of cases nationally. The increased incidence of serogroup groups B and W seen during 2014 and 2015 in the North East is consistent with a national trend. In 2015 67% (38/56) of North East laboratory confirmed cases were serogroup B and 23% (13/56) were serogroup W135.

Table 4.2 Laboratory confirmed cases of meningococcal disease by serotype for 2008 to 2016

Serogroup	2008	2009	2010	2011	2012	2013	2014	2015	2016
B	83	68	53	62	48	31	33	38	39
W135	2	1	1	3	3	4	12	13	23
Y	3	1	3	0	4	3	4	4	5
C	1	0	0	0	3	1	2	1	5
Z	0	0	0	0	0	0	0	0	0
Ungrouped	34	45	46	34	48	22	48	25	24
North East Total	123	115	103	99	106	61	99	81	96

Meningococcal disease can affect all age groups but the highest rates of disease are in children under five years of age, with a peak incidence in those under one year of age. There is a second peak incidence in young adults aged fifteen to nineteen years old.

4.2 Invasive Group A streptococcal disease (iGAS) and scarlet fever

Group A streptococcal (GAS) infections are very common and usually produce mild illness easily treated with antibiotics.

Table 4.3: Scarlet fever notifications to NE PHE Centre, Quarter 1 2011/2017

Year	Quarter				Total
	1	2	3	4	
2011	73	41	24	47	185
2012	61	54	30	151	296
2013	193	127	29	67	416
2014	304	523	114	185	1126
2015	464	243	84	162	953
2016	491	367	127	146	1131
2017	310				

Scarlet fever is a rash illness mainly of children caused by GAS. It is notified by clinicians to PHE. Scarlet fever can occasionally lead to serious complications. These are to a large extent preventable by treatment of scarlet fever with antibiotics.

Following the increase in notifications of scarlet fever observed in 2014, the number of notifications for 2015 dropped slightly, but remained above historical levels. In 2016, quarterly notifications of scarlet fever were higher than in 2015 for quarters 1- 3, but in quarter 4, there were fewer notifications than in the same quarter in 2015. Across 2016 as a whole, there were 1131 notifications: about 20% more than in 2015 and an increase of five cases on the previous peak in 2014. In Q1 2017 notifications decreased for the first time since 2012, however the number remained above expected levels.

Table 4.4: Invasive Group A streptococcal disease reported to NE PHE Centre, Quarter 1 2011/2017

Year	Quarter				Total
	1	2	3	4	
2011	33	22	12	8	75
2012	21	13	20	33	87
2013	36	61	17	22	136
2014	35	36	28	18	117
2015	47	54	34	33	168
2016	56	59	24	26	165
2017	58				

Invasive Group A streptococcal (iGAS) infection is defined as the isolation of group A streptococci from a normally sterile site (for example in the bloodstream). It encompasses a range of diseases including necrotising fasciitis, septic arthritis, meningitis and pneumonia. It is a serious infection with a case fatality rate of approximately 15-20% within one week of diagnosis.

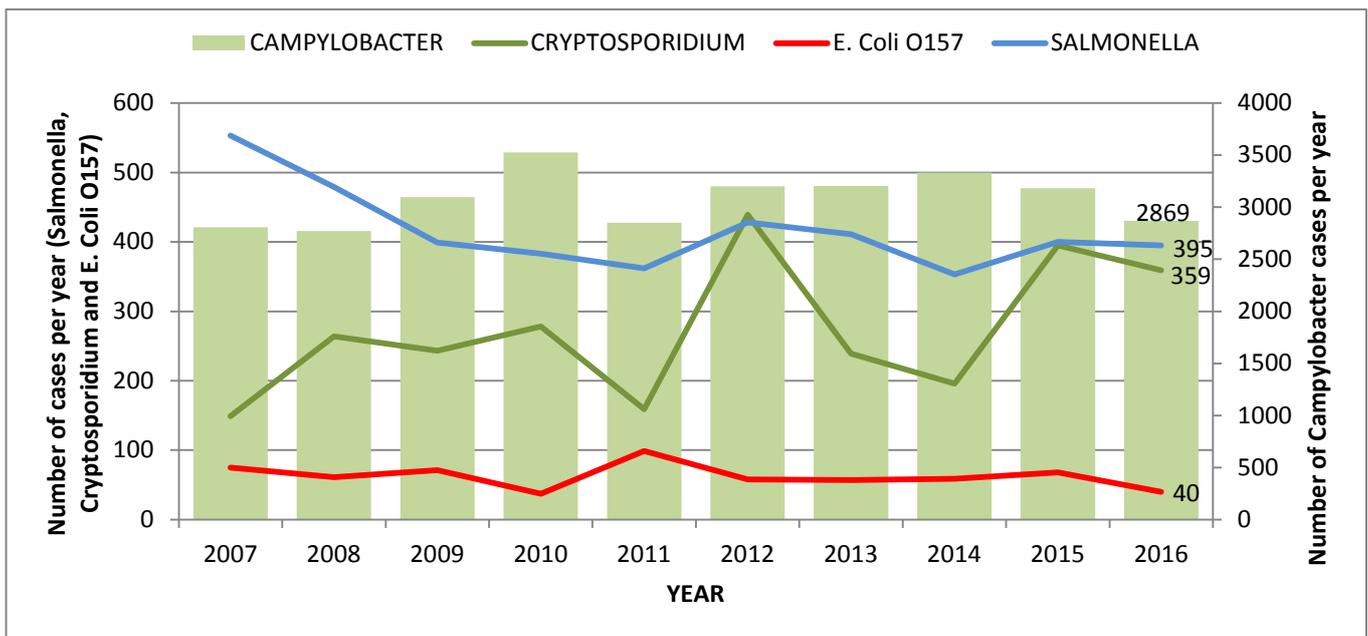
When cases of iGAS are reported by clinicians to the North East PHE Centre, the HPT undertake a risk assessment and provide advice and/or recommend treatment to close community contacts. iGAS infections have a seasonal pattern with the highest incidence from December to April. The Incidence of iGAS in the NE rose significantly in 2013 and has remained elevated with a peak of 168 cases reported in 2015 and a slight decrease to 165 cases in 2016.

4.3 Gastrointestinal infections including food poisoning

A number of organisms can cause gastrointestinal infection of which campylobacter and salmonella are the bacteria most commonly identified by laboratories. A large number of viral gastrointestinal infections occur but most are never laboratory confirmed as symptoms are usually short-lived. Food poisoning outbreaks are described in Section 5. The majority of the NE HPT’s work on gastrointestinal infections relates to individual sporadic cases of infection.

Vero Cytotoxin Producing Escherichia coli (VTEC) infection is caused by the consumption of contaminated food, milk and water or from contact with animals or their faeces. E. coli O157 are the commonest bacteria causing VTEC infection. It is an important infection as only a small number of bacteria are required to cause illness and infection in young children and older people can result in serious complications including kidney failure and is sometimes fatal. The number of cases of VTEC infection in the North East each year is relatively small (39 cases in 2016), but the prevention of cases remains very important due to the risk of severe illness. Every case of VTEC is rigorously investigated by the HPT and the relevant local authority environmental health officers. In 2016 there were no serious outbreaks of VTEC in the North East but there were a number of family clusters of cases.

Figure 4.2: Reported cases of campylobacter, cryptosporidium, salmonella and VTEC infection in North East residents from 2007 to 2016



Campylobacter infection is by far the most common bacterial cause of gastrointestinal infection reported regionally causing more than 75% of all cases. Reducing the numbers of campylobacter cases requires actions at all stages of meat (particularly chicken) production and processing from the farm all the way to, and within, the home. There were more than 300 fewer cases in 2016 compared to 2015 (2869 vs 3183 cases). It is not clear if this decrease will continue as numbers have fluctuated between 2772 and 3525 cases over the past ten years.

Salmonella is the second most common bacterial cause of gastrointestinal infection. All cases of salmonella are investigated by the HPT and the local authority EHOs. The trend in number of cases has been fairly unchanged in recent years with increases in some years associated with local or national outbreaks.

Cryptosporidium infection is the most common protozoal gastrointestinal infection. Infection is often acquired from contact with contaminated animals or with animal faeces in the environment or from contaminated food or water. The incidence varies from year to year and in 2012 and 2015 there were large national outbreaks including increased incidence in North East residents. In 2016 outbreaks of cryptosporidiosis in the North East were associated with using some swimming pools.

Other less common causes of food poisoning such as Clostridium perfringens, Staphylococcus aureus, listeria and yersinia are also investigated. The severity of illness which can be caused by some infections such as listeria means that there is a higher level of concern about even a small number of cases.

4.4 Influenza

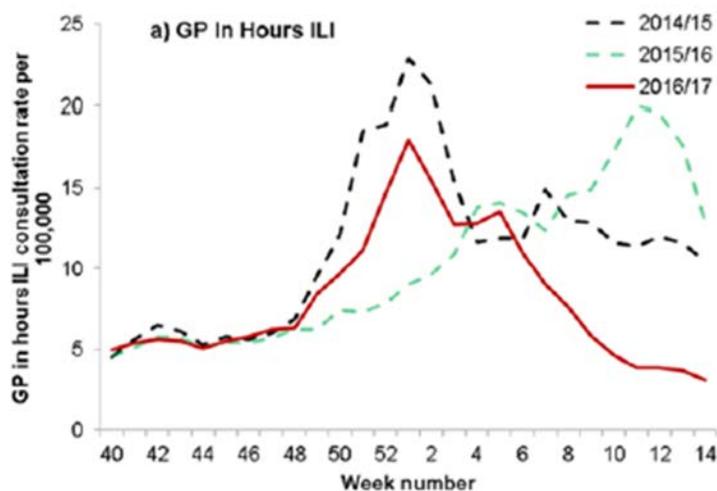
This section should be read alongside the joint NHS England North / PHE seasonal influenza vaccination report 2016/17.

Seasonal influenza.

Moderate levels of influenza activity were seen in the community in the UK during the 2016-17 season, with influenza A(H3N2) the dominant circulating virus.¹ GP consultation rates for influenza like illness (ILI) exceeded the baseline threshold for approximately six weeks and peaked in the first week of 2017 Figure 4.3

In common with previous H3N2 seasons (the last of which was 2014/15), the impact was predominantly seen in older adults with a high proportion of outbreaks (78%) occurring in care homes.¹ The number and rate of hospital admissions for confirmed influenza cases peaked in week 05 2017 (161 admissions, 2.6 per 100,000 population trust catchment area).¹ This peak was lower than the previous influenza season (2015/16) but higher than the last influenza A(H3N2) dominated season (2014/15). ICU/HCU admissions of confirmed influenza peaked in week 01 2017, the majority of which (95%) were due to influenza A. ICU admission occurred in all age groups but just under half (44%) of admissions were aged 65+ years.¹

Figure 4.3: GP in hours consultation rates for ILI winter 2016 – 2017.



Influenza A positivity peaked in week 01 2017 with the highest age-specific activity seen in the 65+ year group. Low levels of influenza B were noted and occurred later in the season.¹ The majority of circulating A(H3N2) strains were genetically and antigenically similar to the North Hemisphere 2016/17 (H3N2) vaccine strain.¹

Excess all-cause mortality was observed in all age groups for six weeks (week 52 2016 to week 05 2017) and predominantly in the 65+ age group.¹

During the 2016/17 season 21 respiratory outbreaks in care homes were reported to the North East Health Protection Team (HPT) of which 12 had one or more confirmed influenza A cases. Antiviral treatment was advised for four of these outbreaks.

Pandemic influenza

A pandemic of influenza infection may occur when a new flu virus circulates to which few people have any existing immunity. In 2016 both the North East and national pandemic flu frameworks were tested during multi-agency exercises.

Avian influenza

Avian influenza is an infectious disease of birds caused by the influenza A virus.² Human infections with avian influenza are rare although some strains such as H5N6, H5N1 and H7N9 have been associated with human illness.

In 2016, a significant number of EU countries reported identification of A(H5N8) in a variety of wild bird species, including migratory birds.³ In December 2016, the Chief Veterinary Officer declared a prevention zone in England to help protect poultry and captive birds from influenza A (H5N8).³ As of 20th March 2017, 10 confirmed outbreaks amongst avian species and 26 wild bird incidents were reported across the UK.³ Two H5N8 incidents were reported to the North

East HPT in early 2017 (one affecting wild birds and the other a backyard poultry flock). To date, no human infections with this virus have been reported world-wide.

PHE works closely with colleagues in the Animal and Plant Health Agency (APHA) and Department for Environment, Food and Rural Affairs (DEFRA) to respond to outbreaks of infection in birds. People who have potentially been exposed to diseased birds or affected premises are monitored for 10 days since last exposure.

Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV)

The World Health Organisation (WHO) first reported cases of MERS-CoV in September 2012.¹ MERS-CoV is a viral respiratory illness, characterised by fever and cough, progressing to severe pneumonia. It has been noted to cause large outbreaks particularly within healthcare settings. Most cases have occurred in the Middle East with some secondary transmission (including cases in the UK) following importation. No positive cases have been reported in the UK since February 2013, but PHE continues to monitor potential cases of severe respiratory disease in returning travellers.¹ In 2016/17 6 possible cases of MERS-CoV were reported to the North East HPT. None of these cases were confirmed.

¹ PHE. Surveillance of influenza and other respiratory viruses in the UK: Winter 2016 to 2017. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/613493/Surveillance_of_influenza_and_other_respiratory_viruses_in_the_UK_2016_to_2017.pdf

² PHE. Avian influenza: guidance, data and analysis. Available at: <https://www.gov.uk/government/collections/avian-influenza-guidance-data-and-analysis>

³ PHE. Avian Influenza A(H5N8) in the UK: risk assessment. Available at: <https://www.gov.uk/government/publications/avian-influenza-ah5n8-risk-assessment>

4.5 Surveillance of sexually transmitted infections (STIs) and HIV

PHE collates anonymised information from genito-urinary medicine/sexual health clinics and infectious diseases services on the number of infections and sexual health screening tests and treatments and produces national annual reports on STIs (in June/July) and HIV (in November) each year. The quality of data reported from North East clinics remains high.

PHE NE continues to produce quarterly and annual reports. These include locally produced reports, as well as the nationally produced annual local authority sexual and reproductive health profiles (LASERs) and the new Spotlight reports of STIs and HIV. Data are also available on the PHE fingertips tool, where stakeholders can review a number of indicators of sexual and reproductive health at a local authority level.

See: <http://fingertips.phe.org.uk/profile/sexualhealth>

The HPT and FES team, together with the PHE NE Sexual Health facilitator, continue to work with local services and commissioners to ensure completeness of reporting to these systems.

The most common sexually transmitted infections in the North East remain chlamydia, genital warts, herpes, gonorrhoea and syphilis. As noted in previous reports, STIs affect certain groups of the population more than others; infections in young people account for over 50% of all STIs, although young people only make up 12% of the population. Higher rates of some STIs also occur in some minority ethnic communities such as black Africans. These groups may also find it more difficult to discuss issues about sexual health or access services to diagnose and treat their infections.

The main roles of PHE with regard to sexual health and HIV are surveillance of infections (see section 3.3), strategic work with partners to tackle the rising levels of sexually transmitted infections and HIV, and response to outbreaks.

More detailed information about the patterns of infection is reported in the North East Annual Sexually Transmitted Infections and North East Annual HIV reports. Data presented in this section are from 2016, the most recent published STI and HIV figures.

During 2016/17 PHE North East has continued to support the wider public health and commissioning system in the region through a series of workshops on sexual and reproductive health data, commissioning of services and workforce development & training including considering sexual health risks and challenges for vulnerable groups, joint work between sexual health and drug & alcohol services on Chemsex and a workshop on interpreting routine data to assess sexual health needs.

Overall numbers of STIs in the North East in 2016

There were 17, 645 new diagnoses (8574 M; 9055 F) of STIs in the North East in 2016, a slight decrease from 2015. The overall rate is 672 / 100 000 population (lower than the England rate of 762 / 100 000).

Chlamydia

Chlamydia remains the most common STI in the region. The number of chlamydia cases diagnosed in North East residents increased slightly in 2016 (5614 cases) compared to 2015 figures (5282), the rate of infection (213 per 100,000 population) is lower than the overall England rate (369/100 000).

The Public Health Outcomes Framework includes the diagnosis rate of chlamydia as one of its targets. This measure combines the coverage of screening programmes with the number of people diagnosed with the infection and has been designed to measure whether screening initiatives are reaching those most at risk. The target is 2,300 diagnoses per 100,000 population (in 15–24 year olds). Achievement of this target has fallen over the past year; further work is taking place with commissioners, services and the sexual health team in PHE NE to understand the reasons for this decline.

Approximately 5% of people who had chlamydia in 2015 had had a previous infection within the preceding 12 months, which is similar to previous years.

Gonorrhoea

Encouragingly, in 2016 figures across England the number of gonorrhoea cases decreased for the first time in recent years. However this was not the case in the North East where numbers increased by 11% from 1570 in 2015 to 1738 in 2016, a rate of 68 per 100,000 population (range across the 12 local authorities of 24 – 92 per 100 000), continuing the trend seen over the previous five years.

The demographics of gonorrhoea cases have shown some changes, in keeping with the outbreaks that have affected young heterosexual adults in various parts of the region, with a decrease in the ratio of males/females from 3:1 in 2005 to 1.3:1 in 2014. Although the majority of cases were in young adults (<24yrs), over the last three years there has been a doubling of cases in men in the 35–44 year age group, highlighting the importance of reaching all groups with prevention and testing messages.

Of interest from a public health perspective is that approximately 4% of cases of gonorrhoea had a previous infection within the preceding 12 months, highlighting the need for on-going campaigns to raise awareness and prevent transmission of infections. The concerns about antibiotic resistance in gonorrhoea continue; there has been an outbreak of highly resistant gonorrhoea in England over the past year; three cases of this strain were seen in the North East in early 2017. Investigations did not discover any links between the cases, however clinicians and laboratories remain vigilant for further cases.

Syphilis

The number of syphilis cases in the North East remained stable at 156 in 2016, following a pattern of year-on-year increase since 2010. Although numbers of cases are much lower than chlamydia or gonorrhoea diagnoses, the potential long-term consequences of syphilis infection mean that this is a development that requires public health action.

Public health concerns

The increase in gonorrhoea and continuing high numbers of syphilis cases highlights the need to remain vigilant to the trends of infection in the population and the importance of surveillance and close networks with clinicians to identify changes in the patterns of infection in the community.

The continuing priority for public health and health protection in the North East is to ensure that commissioners and providers continue to work together to identify common areas for action, to tackle the rise in STIs, in particular gonorrhoea and syphilis, in a consistent, collaborative and effective way across the region.

HIV

The North East has a relatively low number of cases of HIV infection. In 2015 (the latest data available) 122 people were newly diagnosed with HIV. This brought the total of people living with HIV in the North East to 1696.

It is important that the focus on preventing infection is maintained along with improving rates of HIV testing in non-specialist settings to ensure that those who have HIV are diagnosed promptly and offered effective treatment and support and advice about reducing risks to others.

As with other STIs, HIV infection affects some groups of the population disproportionately and it is important that services and prevention work reflect the pattern of infection in local populations.

Key issues about HIV in 2016/17 include:

- Thirty-nine per cent of newly diagnosed cases of HIV in 2015 were diagnosed 'late' or 'very late', which has a significant impact on long-term health outcomes. Late diagnosis remains an important challenge for the region, as well as for England as a whole and PHE is supporting work through the HIV Clinical Network to explore the reasons for late diagnosis and put in place actions to increase testing and improve early diagnosis.
- Twenty-two per cent of people newly diagnosed with HIV in 2015 had acquired their infection within the preceding four to six months (classed as 'recent' infections) highlighting the need to continue the work to prevent transmission of infection
- An increase in transmission amongst men who have sex with men (MSM), following several years where heterosexual transmission was greater than that in MSM.

Over the past year, PHE has worked with clinical and laboratory colleagues to introduce enhanced surveillance of newly diagnosed HIV cases to help understand transmission patterns within the region and target prevention activities.

PHE North East has also facilitated the roll-out of HIV Home sampling project in all 12 local authorities in the North East; this nationally coordinated project, with tests funded by local authorities and PHE, aims to increase testing in high risk, hard to reach groups and so aid earlier diagnosis of HIV in these groups. By the end of the first year, almost 1500 HIV tests had been returned from NE residents; almost half of these responders had never had an HIV test before, thus meeting the aim of the project which was to increase testing and diagnosis in

people who are unaware of their possible diagnosis. Work is continuing to review in more detail who is using this service, how to target messages about testing in those most at risk/need and ensure services are meeting those needs.

4.6 Hepatitis B and C infections

Hepatitis B (HBV) infection

The hepatitis B virus (HBV) causes hepatitis (inflammation of the liver) and can also cause long term liver damage. Many people have no symptoms while others experience a flu-like illness, tiredness, joint pains, and a loss of appetite. Other symptoms may include nausea and vomiting. Acute infection can be severe causing abdominal discomfort and jaundice. Mortality during the acute phase of infection is less than 1%.

The virus may be transmitted by contact with infected blood or body fluids such as through household or sexual contact with an infected person. The virus can be spread by the following routes:

- Sharing the use of contaminated equipment during injecting drug use.
- Vertical transmission (mother to baby) from an infectious mother to her unborn child
- Sexual transmission
- Receipt of infectious blood (via transfusion) or infectious blood products (for example clotting factors)
- Needlestick or other sharps injuries (in particular those sustained by hospital personnel)

About 90% of cases recover fully from the acute infection and develop immunity. The remaining 10% develop chronic hepatitis B which is frequently asymptomatic and cases may be unaware of their infection. Many chronic hepatitis B cases remain infectious and are at risk of developing cirrhosis and liver cancer in later years. An effective vaccine is available that can provide pre and post-exposure protection against hepatitis B infection. Where indicated, medical treatment of chronic infection may be effective in more than 50% of cases.

The North East Health HPT provides direct public health advice in relation to cases of acute hepatitis B and their contacts. In 2016 a total of 16 cases of acute infection were reported in the North East (see table below) compared to 8 cases in 2015, 16 cases in 2014 and 17 cases in 2013. The median age of cases was 48 years. Sexual transmission, was the most likely route of exposure for 11 (69% of cases), with seven cases reporting sex between men and women as the most likely source.

During 2016, 196 new diagnoses of chronic hepatitis B infection were reported across the North East. Written public health advice is given for chronic cases and their contacts via the treating clinician.

Table 4.5: Acute Hepatitis B cases reported to the North East Health Protection Team in 2016

	Male	Female	Total
Number (%)	9 (56%)	7 (44%)	16
Median age (range)	48 (23-72)	46 (27-74)	48 (23-74)
Ethnicity			
- White British	6	5	11
- Unknown	3	2	5
Most likely place of transmission			
- UK	3	3	6
- Outside UK	1	2	3
- Not known	5	2	7
Most likely Source			
- Heterosexual sex	4	5	9
- Sex between men	2	0	2
- Unknown/other	4	1	5

Hepatitis C (HCV) infection

It is estimated that around 160,000 people in the United Kingdom have chronic hepatitis C virus (HCV) infection, many of whom are unaware that they are infected. HCV is transmitted mainly through exposure to blood, blood-contaminated equipment or much more rarely by sexual intercourse or from mother-to-baby. Injecting drug use remains the most important risk factor for HCV infection in the United Kingdom. Although most people with acute HCV infection do not have any symptoms, 80% develop chronic infection and may develop cirrhosis, liver failure or liver cancer 20-40 years later. There is no vaccine to prevent HCV but people with HCV infection can benefit from the protection offered by hepatitis A and B vaccines.

There have been major developments in hepatitis C treatments over recent years with the advent of highly effective and well tolerated directly acting antiviral drugs. If diagnosed, most patients can be cured of their infection. Hepatitis C treatment in England is now being delivered through NHS Operational Delivery Networks (ODNs) which were established during 2015. During 2016/17 approximately 400 patients across the North East and Cumbria received hepatitis C treatment. Written public health advice is given for hepatitis C cases and their contacts via the treating clinician.

In England, the incidence of HCV-related end-stage liver disease and hepatocellular carcinoma appears to have remained stable over the last five years and during 2016 there was an 8% fall in the number of deaths in England from these indications. This may be relative to the availability of new treatments for those patients with advanced liver disease.

Undetected HCV infection means that an individual cannot benefit from treatment and they may also continue to be a source of infection to others.

As in previous years, key public health actions are to continue work on prevention and increase detection and treatment of hepatitis B and C, especially among high risk groups such as injecting drug users and prisoners. An enhanced prison-based screening and referral pathway for HCV (and also HBV and HIV) has successfully been implemented in one North East prison and is now being rolled out to other prisons across the North East. PHE North East continues to actively supporting the North East and Cumbria Hepatitis C ODN to ensure effectively delivery of treatment in the region.

4.7 Tuberculosis

There were 123 cases of TB reported to the Enhanced Tuberculosis Surveillance System (ETS) in North East residents for the calendar year of 2016 (provisional data). This gives an incidence of 4.9 cases per 100,000 population which is the same as for the finalised 2015 data.

TB incidence in the North East is much lower than that for the UK as a whole, (10.5 cases per 100,000 in 2015). Rates of disease vary across the North East, with rates typically higher in urban areas. In the finalised 2015 data, highest rates were reported in Newcastle and Middlesbrough local authority areas, with rates of 15.7 and 9.3 per 100,000 respectively, compared to less than 3 per 100,000 in North Tyneside, Northumberland, County Durham, Hartlepool and Redcar & Cleveland.

In addition, while the national incidence has shown a sustained significant decrease for three consecutive years, incidence in the North East has remained relatively static (subject to expected year-to-year variation). If we are to eradicate TB as a cause of public health concern, as per the WHO ambition, then we need to do more in the North East despite our low incidence.

In contrast to the national picture, almost half of cases of TB in the North East (43% in 2015) were in people born in the UK. In 2015, the incidence of TB in the most deprived quintile of the North East population was 9.1 per 100,000: more than thrice that in the least deprived quintile (2.7 per 100,000). In addition, 12% have social risk factors such as homelessness, imprisonment, and drug or alcohol misuse. Hence, the epidemiology strongly points us towards taking further action to find and treat TB in underserved groups.

The completion rate for TB treatment is an outcome monitored as part of the Public Health Outcomes Framework. Treatment for TB is complex, and typically involves taking a number of antibiotics for a period of at least six months. In 2015, 82% of North East cases completed treatment within 12 months (excluding drug resistant, nervous system, spinal, military and cryptic disseminated TB cases, for which standard treatment regimens typically last longer than 12 months). This figure rises to 87% when deceased cases are excluded. Considering the demographics of TB cases in the North East, this is testament to excellent work on the part of community TB teams, who succeed in engaging a typically 'hard to reach' cohort in prolonged continuous treatment.

TB is one of PHE's national priorities, as reflected in the Collaborative Tuberculosis Strategy for England 2015-2020. The North East and Yorkshire and The Humber TB Control Board oversees delivery of the TB Strategy across these two regions, and to help provide assurance that appropriate TB services continue to be commissioned and that the community TB nursing services are fully supported.

In 2016, we re-established the North East TB Network, which brings together hospital respiratory teams, community TB nurses, local authorities, CCGs and PHE on a bi-annual basis. This allows us to think collectively about our approach to TB across the region, and to take collective action to ensure that TB cases in the North East are swiftly detected and effectively treated.

4.8 Invasive Pneumococcal Disease (IPD)

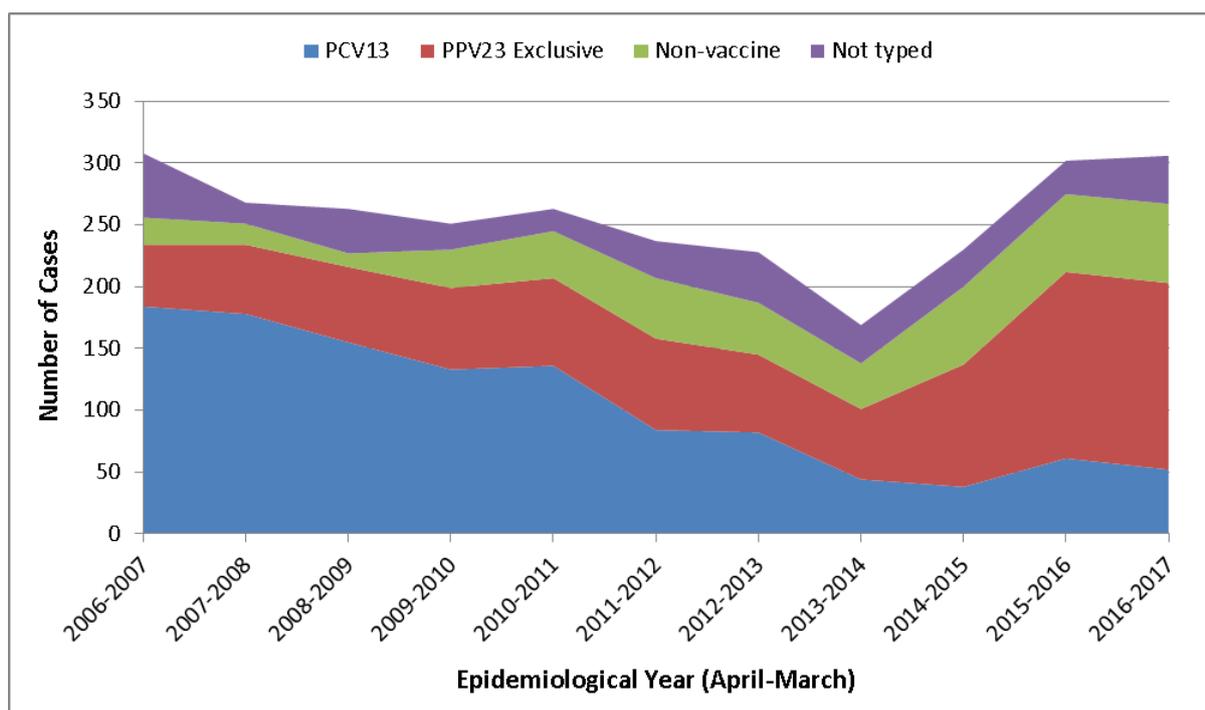
IPD is a serious infection caused by *Streptococcus pneumoniae*. The most common manifestations of IPD are bacteraemic pneumonia, septicaemia and meningitis. IPD disproportionately affects young children, older aged adults and individuals with a weakened immune system. Two vaccines protecting against common pneumococcal serotypes are currently licensed in the UK: the 13-valent Pneumococcal Conjugate Vaccine (PCV), which is included in the childhood immunisation programme, and the 23-valent Pneumococcal Polysaccharide Vaccine (PPV23), which is recommended to all individuals aged ≥ 65 years and clinically defined risk groups aged 2-64 years.

Prior to 2014-15 the incidence of IPD in the North East had decreased from 12.1 cases per 100,000 in 2006-07 to 6.5 cases per 100,000 in 2013-14. However, the incidence of IPD unexpectedly rose in 2014-15 and 2015-16 and plateaued in 2016-17 at 11.7 cases per 100,000 population, a rate similar to that reported in 2006-07.

Although the incidence of IPD caused by PCV13 serotypes has decreased dramatically since PCV13 implementation, non-PCV13 IPD has increased. In particular, serotypes exclusive to PPV23 have risen substantially since 2013-14. In addition, non-vaccine IPD has continued to rise since 2006-07 as a result of pneumococcal serotype replacement. The rise in the number of PPV23 exclusive and non-vaccine IPD occurred in all age groups but was highest in older adults.

The proportion of individuals in clinical risk groups who developed IPD who were reported to have previously been immunised remains low - 40% in 2016-17. These findings highlight the need for continued surveillance of the distribution of pneumococcal serotypes and regular evaluation of national immunisation schedules in order to tackle the persistent burden of IPD.

Figure 4.4: Number of IPD cases in the North East, April 2006 – March 2017 by serotype



PCV13: 13-valent pneumococcal conjugate vaccine serotype cases; PPV23 Exclusive: 23-valent pneumococcal polysaccharide vaccine serotype cases, excluding those also captured by PCV13; Non-vaccine: non-vaccine type serotype cases; Not typed: cases of IPD with no pneumococcal serotype provided.

4.9 Healthcare associated infection (HCAI)

Prevention and control of healthcare associated infections (HCAIs) is the responsibility of provider organisations. PHE supports organisations in this work in a number of ways.

PHE's Field Epidemiology Service (FES) supports the collection of surveillance data on a number of commonly healthcare-associated infections using a number of systems, as discussed in Section 3.2.

The data generated through these systems is then adopted by the NHS. For organisms such as MRSA and Clostridium Difficile, a complex set of rules and appeals are applied to this data, through which Trusts, CCGs and NHS England collectively 'assign' cases of infection to Trusts (implying that these are healthcare associated infections) or to communities (implying that these are community-acquired sporadic cases of infection). Typically, Trusts have targets for the number of 'Trust assigned' cases of these infections occurring in a given year with financial and other penalties should these targets fail to be reached.

Nationally and internationally, there is an increasing focus on gram negative bacteria in healthcare settings. This is linked to the antimicrobial resistance agenda: there are fewer antibiotic options for gram negative organisms, and the proportion of gram negative organisms resistant to existing antibiotics is growing.

As a result, new national targets are being introduced on the number of healthcare associated blood stream infections caused by gram negative bacteria. In addition, there is focus on all infections caused by carbapenemase-producing enterobacteriaceae (CPE). This is a large family of gram-negative bacteria which are able to break down carbapenem antibiotics, which are commonly used to treat gram-negative infections. Outside of the North East, there have been large hospital outbreaks of CPE organisms, and so all Trusts now have special infection control arrangements for CPE cases. The number of CPE cases is also carefully monitored by PHE's Field Epidemiology Service on behalf of the NHS.

The Health Protection Team (HPT) supports Trusts through providing expert guidance on outbreaks and incidents in Trusts, especially where these outbreaks involve pathogens more commonly associated with community outbreaks. For example, in 2016/17, the HPT supported Trusts with outbreaks of influenza, salmonella and Clostridium Difficile.

4.10 Antimicrobial Resistance

Antimicrobial resistance remains a growing threat to public health. It is not a new problem: the first bacteria resistant to penicillin were discovered the same year as the drug itself. Yet as a result of a wide range of factors, including indiscriminate use of antibiotics in medicine and wider society, and few major developments in antibiotics over many years, antimicrobial resistance is now reaching a critical point.

Antimicrobial resistance is not solely a human health problem: action needs to be taken in many different areas in order to effectively tackle the problem, including the farming and veterinary sectors. The UK's Antimicrobial Resistance Strategy³ is intended to ensure that action is taken across government. NICE Guidance⁴ published in January underlines the need for action across the public and private sector in order to change AMR risk-related behaviours in the general population.

There have been recent changes in the allocation of national responsibility for the health aspects of Antimicrobial Resistance, with NHS England having the primary leadership role.

In the North East, PHE supports the antimicrobial resistance agenda through surveillance and expert microbiological advice.

The majority of hospital Trust laboratories in the North East electronically report the results of antibiotic sensitivity tests from microbiological specimens. This data, along with clinical and pharmacological expertise, is used to allow microbiologists to refine hospital and community antibiotic formularies, ensuring that patients are given the most appropriate empirical antibiotic treatments before the sensitivities of their specific isolate are known.

The North East Centre publishes a dedicated AMR report for microbiologists in the region, bringing together surveillance data and expert clinical commentary. This unique format of AMR surveillance reporting has been presented internationally as an example of good practice.

In addition, the PHE Regional Microbiologist has established a regional antibiotic steering group with cross-system representation. This aims to co-ordinate practical action across organisations at a regional level. Its initial focus is on ensuring that urinary tract infections are appropriately assessed across the health economy, with antibiotics given only where necessary, and ensuring that the right antibiotic is given at the right dose for the right length of time.

³<https://www.gov.uk/government/publications/uk-5-year-antimicrobial-resistance-strategy-2013-to-2018>

⁴<https://www.nice.org.uk/guidance/ng63>

5 Control - responding to communicable disease outbreaks and incidents

5.7 Overview

Outbreaks of infectious diseases are relatively common and community-based outbreaks are managed through an agreed local operational response by the NE HPT, local authorities and the NHS. Considerable effort is also put into the prevention of outbreaks through activities such as the inspection role of environmental health officers, NHS and PHE roles in relation to immunisation and infection control and the monitoring actions of other bodies such as water companies.

Some organisms are implicated relatively often in outbreaks such as norovirus (winter vomiting virus). Outbreaks of norovirus are very common but the disease (vomiting and some diarrhoea) is almost always self-limiting. Concern is higher in relation to an outbreak where more serious disease occurs, for example, E. coli O157 can cause serious illness including kidney damage.

Risk assessment includes the organism (or probable organism), mode and ease of transmission, possible numbers exposed, setting and vulnerability of those exposed. The risk of an outbreak is higher in certain settings (e.g. prisons, schools, care homes) and among some groups (e.g. people who inject drugs, people who are homeless).

The most common outbreaks are of vomiting/diarrhoea in care homes and outbreaks of food poisoning possibly associated with restaurants or catered events.

Public health action is taken to control the outbreak by any combination of controlling the source of the organism (e.g. better hygiene in a food premises), ceasing exposure (e.g. withdrawing a food from sale, hygiene and cleanliness in care homes), breaking the chain of transmission (e.g. by treatment of cases, isolation of cases in hospital), reducing vulnerability (e.g. by immunisation or antibiotic prophylaxis).

In addition to managing community incidents and outbreaks, the HPT supports the management of incidents in hospitals.

5.8 Numbers and types of incidents

In total, in 2016/17, the NE HPT was involved in investigating and where necessary managing **132** community outbreaks, incidents and clusters (including non-GI care home incidents). There were also **250** outbreaks of gastrointestinal illness in care homes, compared with **275** in 2015/16.

This involved **19** incident /outbreak control teams being established by the HPT (22 in 2015/16).

Table 5.1: Community incidents/outbreaks led by PHE requiring an Incident/Outbreak Control Team arising in 2016/17

Organism	Type of setting or exposure	Number distinct incidents or outbreaks	Key issues
Gastroenteritis	Pub/catered event	1	Probably viral person to person spread, noted that no formal Food Safety Management System in place.
	Care home	1	No obvious cause on sampling. Minor hygiene issues identified.
Clostridium difficile	Care home	1	Infection control issues identified. Training and remediation put in place.
Hepatitis A	School	1	Child with Hep A attended school whilst infectious. Multi agency response required to coordinate vaccination of children and staff.
Cryptosporidium	Community	2	One small outbreak linked to a swimming pool. No obvious precipitating incident or omission relating to pool management identified.
			One outbreak linked to two community pools. No obvious precipitating incident and minor improvements in pool maintenance suggested.
Influenza	Prison	1	Outbreak requiring multiagency response to arrange treatment and prophylaxis.
Enteroinvasive E. coli	Community – residential premises	1	Source not identified. Food preparation and handling good.
Norovirus	Restaurant/ catered event	3	One probable person to person spread, with illness prior to function.
			One probable contamination with norovirus at the premises. One no obvious source, minor hygiene issues identified.
Salmonella	Restaurant/ catered event	1	Probable cross contamination within premises.
	Community	2	One outbreak linked to a takeaway and supply chain. Hygiene issues identified and improvement notice served. One outbreak no definitive source identified but likely to be linked to national issues and egg supply.
TB incidents	College/University	2	Multiagency risk assessments performed for all four incidents. Screening exercises undertaken as appropriate.
	Community	1	
	Care home	1	
TB case	Community	1	Challenging patient non-compliant with treatment. Required multiagency meeting and plan.

5.9 Hospital incidents/outbreaks

Incidents and outbreaks occurring in hospitals are the primary responsibility of NHS trusts and the response is led by the trust Director of Infection Prevention and Control. However, the HPT provides advice and support, calling in national advice as needed. In 2016/17 the HPT provided support in 19 significant incidents (compared with 19 in 2015/16, 16 in 2014/15, 21 in 2013/14 and 11 in 2012/13).

Norovirus

Norovirus outbreaks impact on the capacity of acute hospitals as a consequence of ward closures. This contributes significantly each year to 'winter pressures'. Since January 2010 a voluntary reporting system for Norovirus has been in place with local figures reported below.

- 2010 - 79 outbreaks reported (under-reporting to new system)
- 2011 – 123
- 2012 – 240
- 2013 – 104
- 2014 – 90
- 2015 – 72
- 2016 – 83
- 2017 – 25 up to 31/03/17

5.10 Gastrointestinal illness in care homes

In 2016/17 there were 250 outbreaks of GI illness in care homes compared with 275 in 2015/16, 328 in 2014/15, 259 in 2013/14, 346 in 2012/13 and 284 in 2011/12 (based on date of report).

The outbreaks comprised:

- 211 probable/ confirmed Norovirus
- 21 Rotavirus
- 6 probable/confirmed Clostridium perfringens
- 5 confirmed Sapovirus
- 3 Astrovirus
- 3 unknown
- 1 Clostridium difficile

When a care home contacts the HPT to report cases of vomiting and/or diarrhoea, an initial risk assessment is carried out to determine if further investigation is required to exclude a food source or other factors. If a viral outbreak is considered probable, then standard advice is given to follow the pre-circulated care home guidance. The local authority EHOs, hospital and community infection control nurses are informed routinely of outbreak occurrence and the closure of the home to admissions and discharges.

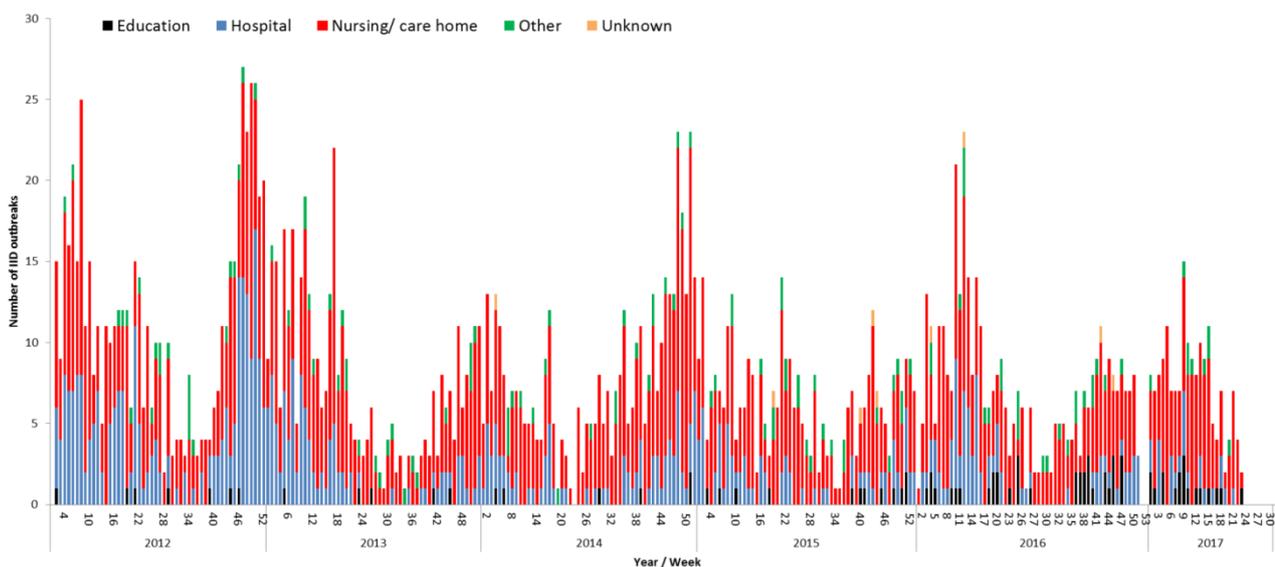
If there are concerns about duration of the outbreak or an apparent lack of understanding on the part of the care home staff, then the HPT would liaise with the community infection control

nurses to discuss further input. EHOs would become actively involved if there is thought to be a food source or other organisms are potentially involved.

5.11 Overview of gastrointestinal infectious disease outbreaks

As part of routine winter surveillance, FES provide a weekly report on gastrointestinal infectious diseases (figure 5.2 next page). This shows all gastrointestinal infectious disease outbreaks across the North East, demonstrating the considerable reduction in outbreaks (mainly norovirus) in winter 2013/14 compared with the previous two years. Since then both in winter 2014/15 and in winter 2015/16, levels were similar to 2011/12 though again in 2016/17 the peak was not as pronounced.

Figure 5.1: All reports of gastrointestinal infectious disease outbreaks (suspected or confirmed) by setting in North East week 1, 2012 to week 24, 2017



6 Emergency preparedness, resilience and response (EPRR)

6.1 Preparedness

Structures and Processes

PHE North East has internal systems for escalation of response to communicable disease and other hazards or threats. This enables progressive mobilisation of national specialist support and capacity. For some types of incident, in particular threats related to terrorism, national expert advice and rapid escalation will be immediate.

The centre delivers these functions through the HPT and the emergency preparedness manager (EPM). The HPT second on-call rota provides a senior level, 24/7, response to major incidents and emergencies in the North East, supported by the EPM on a 24/7 regional (North of England) rota. PHE's national Centre for Radiation, Chemical and Environmental Hazards (CRCE) provides 24/7 support to local response with detailed information available on the PHE website.

The centre is represented on the three multi-agency Local Resilience Forums (LRFs) at strategic and sub group levels. The North East LRFs (Northumbria, Durham and Darlington, and County Cleveland) coordinate planning, training and exercising in relation to a range of threats identified in their community risk registers. During 2016/17 the NE LRFs have continued to develop cross LRF working in a number areas with full support from the PHE Centre who currently hold the positions of Chair of the NE Training and Exercising Chairs Group and Vice-chair of the NE CBRN Group.

In addition the centre is represented on and actively involved in the work of the North East Local Health Resilience Partnership and its two geographic Health and Social Care Resilience Groups (Northumbria and Durham, Darlington and Tees).

PHE North East continues to maintain a strong collaborative working relationship with the NHS England Cumbria and the North East EPRR team including a joint work plan covering areas such as pandemic flu, communications and mutual aid.

Plans

The North East centre maintains internal plans for response to a range of incidents. These are linked to national plans and supporting materials. The most likely incidents to have a public health impact and require a significant multi-agency response are a large fire, chemical release or major outbreak of a communicable disease.

The centre contributes to LRF plans for a range of incidents. There are a number of major industrial sites in the North East which are required to produce Control of Major Accident Hazards (COMAH) off-site plans. The PHE Centre continues ensure that COMAH plans for the NE are consistent with PHE response arrangements.

The responsibility for the Science and Technical Advice Cell (STAC) plan, activation and management continues to rest with PHE. The North East PHE Centre *STAC Activation Plan* is in place and Directors of Public Health have agreed to continue providing the STAC chair role through an on-call rota with honorary contracts in place.

The PHE centre has led on the delivery of a new NE Individual Chemical Exposure (ICE) Protocol and the review and delivery of an updated NE Pandemic Influenza Framework including NE wide consultations.

Exercises and Training

PHE Centre staff are actively engaged in supporting the planning and management of multi-agency exercises across the region. In 2016/17, these exercises included a range of scenarios such as pandemic flu, chemical release, viral haemorrhagic fever (VHF) and cyber-attack. Exercises are at either tactical level or strategic level.

The establishment of the Science and Technical Advice Cell (STAC) was tested during Exercise Ironstone, the Cleveland LRF Strategic Exercise which provided an excellent opportunity to test the delivery of a virtual STAC. The PHE Centre also led on the planning and delivery of Exercise Swan a NE LRFs strategic pandemic influenza exercise.

Internally the North East has played into a national E-Coli outbreak exercise and was one of the host centres for the Command Post Exercise for (CPX) 2017 Exercise Typhon in which the Centre's ability to respond to a locally identified case of VHF was exercised alongside our ability to stand up and run an Incident Coordination Centre (ICC) over two days.

STAC awareness training continues to be offered to LRFs, particularly delivered prior to STAC exercises and annual updates provided to Directors of Public Health.

Internally within the Centre training is regularly delivered on EPRR Awareness for all staff and on the establishment of the ICC, the PHE Centre is currently represented on a national working group aimed at the standardisation of EPRR training across PHE.

6.2 Response

The PHE Centre is informed about non-infectious disease incidents through a number of alerting mechanisms. The main alerting protocol is from the North East Ambulance Service to the on-call EPM out of hours or the HPT in hours who triage the incident, calling the PHE Centre patch consultant in hours (second on-call out of hours) according to agreed triggers. There are also agreed protocols with the Fire and Rescue Services. Certain incidents come directly to the HPT consultant on call.

In 2016/17, the majority of alerts received by the EPMs required an initial risk assessment only, with no further action required to protect the population. However, a number required both acute and follow-up response from HPT consultant staff and, for some, specialist support from PHE nationally.

7 Communications team

The PHE North East communications team is part of the national communications division but embedded within local services. The team serves PHE's broader health and wellbeing remit as well as supporting colleagues within health protection and healthcare public health.

During 2016/17 the team consolidated its strong relationship with communication colleagues in North East local authorities, NHS England and the North of England Commissioning Support Unit via the public health communications network. The network facilitates effective communications activity across the public health system and encourages joint working, particularly on social marketing campaigns and has co-ordinated North East campaigns around sexual health and physical activity.

As well as supporting North East focussed campaigns, the communications team ensured that national campaigns and initiatives were effectively rolled out. Over the past 12 months this has included campaigns such as Be Food Smart, Start4Life's Breastfeeding Friend, Be Clear on Cancer; Breathlessness, Stay Well This Winter, Act FAST and Health Harms. The team also engaged with stakeholders to promote the local launch of national campaigns on Sepsis awareness, Men ACWY vaccination for students, Health Checks and the push for a completely Smokefree NHS.

In addition the PHE North East communications team continued to support the management of outbreaks and incidents and is a key member of outbreak/incident control teams. This has included support for incidents and outbreaks as varied as multi-agency Avian flu work, hepatitis A clusters, response to a large number of seasonal influenza outbreaks in community settings and to local and national outbreaks of foodborne disease due to salmonella, campylobacter and norovirus.

The team has also played an active role in helping to disseminate public health messages during emergency situations and has worked closely with its communication colleagues in local resilience forums to respond to incidents such as fires and pollution.

The communications team was also involved in a number of emergency response exercises including Exercise Cygnus, a large multi-agency exercise to test response to pandemic influenza.

8 Environmental issues

Public Health England supports stakeholders including members of the public in responding to both acute and chronic non-infectious environmental issues. This may require input over a number of months, usually with expert assistance from colleagues in the Centre for Radiation, Chemical and Environmental Hazards (CRCE) Environmental Hazards and Emergencies (EHE) Department and PHE communications staff.

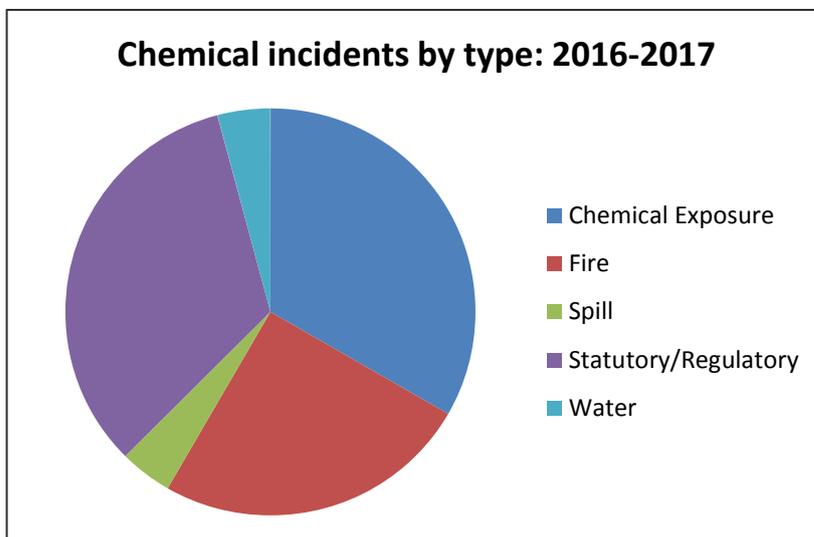
EHE is a front-line department within CRCE. It provides expert advice and support to a range of stakeholders during acute and chronic chemical incidents which have the potential to threaten people's health. Such incidents could involve fires, chemical contamination of the environment, or exposure to chemical and poisons, including scenarios of deliberate release. EHE reviews the evidence base and develops and updates position statements and resources for air pollution episodes, local and regional air quality, and sites and facilities which can prove controversial or benefit from national coordination such as: onshore oil & gas (e.g. shale gas), long running fires, high risk waste sites, energy from waste ('incinerators') and hydraulic fracturing for shale gas. The EHE department covers all of England - the support listed below North East specific.

In 2016/17 CRCE EHE and the HPT have for example:

- Provided advice to both the Environment Agency and a member of the public in relation to long standing complaints arising from emissions to air from a local plastics manufacturer.
- Provided support and advice to health protection colleagues in relation to health risks from a proposed gasification plant.
- Provided support to the Environment Agency and Gateshead Council in relation to complaints regarding odour from a flooded landfill.
- CRCE have provided nine consultation responses under environmental permitting, local planning and national significant infrastructure planning regimes. Note that CRCE have a risk based agreement with the Environment Agency whereby only potentially significant bespoke permit applications are consulted upon.
- Twenty-Four chemical incidents and enquiries required EHE input, on a range of subjects including water contamination, a number of fires at industrial premises, and chemical exposures in various settings. Prompt advice regarding decontamination minimises health and health systems impacts.
- CRCE have updated or provided new initial reference sheets for eleven COMAH sites, which provide initial site summaries and public health guidance for incidents at COMAH sites. As part of this work, CRCE has also worked closely with the North East Emergency Preparedness Manager to ensure that relevant emergency plans that involve chemical risks remain current and accessible to staff.
- Supported the Health Protection Team and identified lessons-learned in formal incident debriefs including one relating to a fire at an industrial site in the North East.
- Provided support to the Health Protection Team on Air Quality issues, such as co-hosting an Air Quality Awareness day in the North-East.
- Developed scenarios for local and national exercises and supported the Health Protection Team in a recovery exercise hosted by Durham Local Resilience Forum.

- CRCE has contributed to an awareness session for local authority Public Health Teams; showcasing both our acute and proactive work including discussion of contentious environmental public health issues.
- Delivered training at local universities.
- Provided orientation training to Health Protection staff, in particular Specialist Trainees.
- Worked with NEAS to develop an experiment to provide better risk assessments for chemically contaminated patients.
- Participated in the Exploring Novel Psychoactive Substances (NPS) conference hosted by PHE and Newcastle University and membership of the PHE NPS Network, thereby broadening CRCE’s experience in responding and referring drug enquiries that are received by the National Duty Desk.

Figure 9.1: Chemical incidents by type: 2016-2017



9 Improving the quality of health protection services

10.1 User satisfaction survey

The HPT have routinely surveyed users of the service since 2012. Questionnaires are sent to one in every ten enquiries. A total of 207 questionnaires were posted in 2016 and 143 returned (69%). There was general improvement on percentages from 2015.

A summary of the key findings are as follows:

- 90% had contacted the HPT either once or twice in the previous 12 months.
- 95% said they were given the appropriate amount of information.
- 96% said that they had understood the advice given 'a lot' or 'completely'.
- 97% said that they had confidence in the response from the health protection nurse/practitioner.
- 98% of responders rated their overall satisfaction as either good, excellent or above average.

Comment from respondents are collected and the following encompasses the general themes returned; 'Polite, prompt, efficient and proactive'

10.2 Audits undertaken by the Health Protection Team

The HPT has an audit programme with audit included as part of the appraisal/objective setting for all team members. In 2016/17 the following audits were undertaken:

- Audit of Entamoeba histolytica cases notified to the HPT to review the management of cases and make recommendations for the future case investigation.
- Audit of measles cases reported to the HPT to review the completeness of public health actions and the documentation of these, returns of oral fluid test kits and requirement for post exposure prophylaxis.
- Audit of salmonella and cryptosporidiosis case investigations to review the completeness and timelines of collection of exposure information from cases.

FES team members also contributed to a national audit of the epidemiology and management of clusters of meningococcal disease in order to inform future evaluations of the impact of vaccines on clusters. Findings of audits are reported internally and actions implemented through the unit management team.

10.3 Research and Development

As in previous years in 2016/17, HPT and FES staff have actively engaged in a number of research projects. In addition staff produced reports, presentations and posters to disseminate the lessons from key incidents and outbreaks to professional audiences outside the North East.

Publications in 2015/15 included:

- Papers in peer review journals – 11
- Oral presentations at national/international conferences – 4
- Poster presentations at national/international conferences – 8
- Audits - 3

Further details of publications are included in appendix 4.

Appendix 1: Notifications and other Reports of Infectious Disease in North East residents in 2016

Region	Sub Region	Local Authority	Disease										
			Measles ¹		Mumps ¹		Rubella ¹		Meningococcal disease ¹		Whooping cough ¹		
			No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	
North East	County Durham & Darlington	County Durham	22	4.2	68	13.0	7	1.3	19	3.6	96	18.4	
		Darlington	3	2.8	14	13.3	6	5.7	3	2.8	5	4.7	
		Total	25	4.0	82	13.1	13	2.1	22	3.5	101	16.1	
	North of Tyne	Newcastle upon Tyne	4	1.3	77	26.0	0	0.0	15	5.1	34	11.5	
		North Tyneside	8	3.9	50	24.6	0	0.0	4	2.0	28	13.8	
		Northumberland	7	2.2	45	14.2	1	0.3	13	4.1	53	16.8	
		Total	19	2.3	172	21.1	1	0.1	32	3.9	115	14.1	
	South of Tyne & Wear	Gateshead	12	6.0	32	15.9	2	1.0	10	5.0	47	23.3	
		South Tyneside	11	7.4	20	13.4	0	0.0	4	2.7	31	20.7	
		Sunderland	8	2.9	36	13.0	1	0.4	9	3.2	106	38.1	
		Total	31	4.9	88	14.0	3	0.5	23	3.7	184	29.3	
	Tees	Hartlepool	5	5.4	15	16.2	0	0.0	5	5.4	9	9.7	
		Middlesbrough	12	8.5	25	17.8	2	1.4	6	4.3	9	6.4	
		Redcar and Cleveland	7	5.2	34	25.1	0	0.0	4	3.0	7	5.2	
		Stockton-on-Tees	11	5.6	40	20.4	0	0.0	4	2.0	14	7.2	
		Total	35	6.2	114	20.2	2	0.4	19	3.4	39	6.9	
	Total		110	4.2	456	17.3	19	0.7	96	3.6	439	16.6	
	England & Wales	Total		1637 ²	3	5135 ²	9	343 ²	1	1753 ³	3.0	2,061 ²	4

1 Data source: EpiNorth3, 2016 data.

2 Data source: NOIDS, 2016 data used. Local and national data are not comparable, only cases which have been notified by a registered medical professional are included in the national data.

3 Data source: HPZone 2016 data for England only

4 SGSS, 2016 data. Includes cases confirmed by NHS laboratories only.

5 Data source: HPZone 2016 data for England only. Includes reported infections of hepatitis A, B, C and E.

6 Data source: Enhanced Tuberculosis Surveillance (ETS), 2016 data.

7 Data source: Enhanced Tuberculosis Surveillance (ETS), 2015 data for England only.

All rates are per 100,000 population, calculated using mid-year population estimates for 2016 from the Office of National Statistics (ONS)

Protecting the population of the North East from communicable disease and other hazards. Annual Report 2016/17

Region	Sub Region	Local Authority	Disease										
			E. coli O157 ¹		Salmonella ¹		Campylobacter ¹		Cryptosporidium ¹		Legionellosis ¹		
			No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	
North East	County Durham & Darlington	County Durham	12	2.3	93	17.8	577	110.5	86	16.5	3	0.6	
		Darlington	3	2.8	13	12.3	94	89.0	24	22.7	0	0.0	
		Total	15	2.4	106	16.9	671	106.9	110	17.5	3	0.5	
	North of Tyne	Newcastle upon Tyne	2	0.7	41	13.8	363	122.4	38	12.8	2	0.7	
		North Tyneside	1	0.5	28	13.8	276	135.8	17	8.4	3	1.5	
		Northumberland	1	0.3	26	8.2	360	113.9	42	13.3	0	0.0	
		Total	4	0.5	95	11.6	999	122.5	97	11.9	5	0.6	
	South of Tyne & Wear	Gateshead	4	2.0	25	12.4	191	94.7	36	17.9	1	0.5	
		South Tyneside	1	0.7	19	12.7	125	83.7	23	15.4	0	0.0	
		Sunderland	4	1.4	57	20.5	176	63.3	36	13.0	1	0.4	
		Total	9	1.4	101	16.1	492	78.2	95	15.1	2	0.3	
	Tees	Hartlepool	5	5.4	14	15.1	100	107.7	9	9.7	1	1.1	
		Middlesbrough	2	1.4	20	14.2	166	118.2	9	6.4	3	2.1	
		Redcar and Cleveland	4	3.0	26	19.2	187	138.1	22	16.2	0	0.0	
		Stockton-on-Tees	1	0.5	30	15.3	251	128.3	17	8.7	1	0.5	
		Total	12	2.1	90	15.9	704	124.8	57	10.1	5	0.9	
	Total		40	1.5	392	14.9	2866	108.7	359	13.6	15	0.6	
	England & Wales	Total		1487 ³	2.7	9,460 ⁴	16.2	53,886 ⁴	92.3	5,974 ⁴	10.2	237 ⁴	0.4

1 Data source: EpiNorth3, 2016 data.

2 Data source: NOIDS, 2016 data used. Local and national data are not comparable, only cases which have been notified by a registered medical professional are included in the national data.

3 Data source: HPZone 2016 data for England only

4 SGSS, 2016 data. Includes cases confirmed by NHS laboratories only.

5 Data source: HPZone 2016 data for England only. Includes reported infections of hepatitis A, B, C and E.

6 Data source: Enhanced Tuberculosis Surveillance (ETS), 2016 data.

7 Data source: Enhanced Tuberculosis Surveillance (ETS), 2015 data for England only.

All rates are per 100,000 population, calculated using mid-year population estimates for 2016 from the Office of National Statistics (ONS)

NB: some of the figures in these tables do not match Figure 4.2 because there were a small number of notifications that were not able to be linked to a specific Local Authority area.

Region	Sub Region	Local Authority	Disease									
			Hepatitis A		Hepatitis B		Hepatitis C		Hepatitis E		TB ⁶	
			No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
North East	County Durham & Darlington	County Durham	4	0.8	20	3.8	54	10.3	7	1.3	8	1.5
		Darlington	0	0.0	6	5.7	24	22.7	2	1.9	7	6.6
		Total	4	0.6	26	4.1	78	12.4	9	1.4	15	2.4
	North of Tyne	Newcastle upon Tyne	7	2.4	97	32.7	24	8.1	11	3.7	4	1.3
		North Tyneside	0	0.0	9	4.4	6	3.0	6	3.0	5	2.5
		Northumberland	1	0.3	18	5.7	18	5.7	3	0.9	37	11.7
		Total	8	1.0	124	15.2	48	5.9	20	2.5	46	5.6
	South of Tyne & Wear	Gateshead	0	0.0	24	11.9	33	16.4	5	2.5	13	6.4
		South Tyneside	0	0.0	11	0.0	7	4.7	2	1.3	4	2.7
		Sunderland	1	0.4	12	4.3	19	6.8	8	2.9	8	2.9
		Total	1	0.2	47	7.5	59	9.4	15	2.4	25	4.0
	Tees	Hartlepool	0	0.0	1	1.1	14	15.1	1	1.1	5	5.4
		Middlesbrough	1	0.7	5	3.6	25	17.8	3	2.1	15	10.7
		Redcar and Cleveland	1	0.7	4	3.0	6	4.4	1	0.7	14	10.3
		Stockton-on-Tees	0	0.0	6	3.1	12	6.1	3	1.5	4	2.0
		Total	2	0.4	16	2.8	57	10.1	8	1.4	38	6.7
	Total		15	0.6	213	8.1	242	9.2	52	2.0	124	4.7
	England & Wales	Total	618 ⁵	1.1	5572 ⁵	9.5	6,166 ⁵	10.6	934 ⁵	1.6	1,348 ⁷	10.1

1 Data source: EpiNorth3, 2016 data.

2 Data source: NOIDS, 2016 data used. Local and national data are not comparable, only cases which have been notified by a registered medical professional are included in the national data.

3 Data source: HPZone 2016 data for England only

4 SGSS, 2016 data. Includes cases confirmed by NHS laboratories only.

5 Data source: HPZone 2016 data for England only. Includes reported infections of hepatitis A, B, C and E.

6 Data source: Enhanced Tuberculosis Surveillance (ETS), 2016 data.

7 Data source: Enhanced Tuberculosis Surveillance (ETS), 2015 data for England only.

All rates are per 100,000 population, calculated using mid-year population estimates for 2016 from the Office of National Statistics (ONS)

Appendix 2: Schedule of routine PHE NE Surveillance Reports

	<i>Output¹</i>	<i>Frequency</i>	<i>Dissemination</i>	<i>Email Recipients</i>
Reports sent to external partners	SGSS Trust Feedback Report	Weekly	Email & FES NE website ²	HPT, FES NE, RM, ATMs, others
	SGSS Regional Report & Exceedance Report	Weekly	Email & FES NE website	HPT, FES NE, RM, ATMs
	Influenza Summary (during influenza season)	Weekly	Email	HPT, FES NE, AT, CCGs, Acute Trusts, emergency planners, others
	Seasonal Respiratory Disease Surveillance	Weekly	Email & FES NE website	HPT, FES NE, RM, virologists, contributing ATMs
	HCAIs Monthly Summary (with package of charts)	Monthly	Email & FES NE website	HPT, FES NE, ICNs, RM, ATM, AT
	IPD Laboratory Audit Report	Monthly	Email	FES NE, RM, ATMs
	Syphilis Monthly Report	Monthly	Email	FES NE, GUM clinics
	Quarterly Antenatal Infectious Disease Screening Report	Quarterly	Email & FES NE website	HPT, FES NE, AS Leads, PCT Screening Lead, RASCO
	Local Authority EHO Report ³	Quarterly	Email & FES NE website	LA EHO, SHA
	Local Authority DsPH Report ³	Quarterly	Email & FES NE website	HPT, FES NE, DsPH
	Quarterly Salmonella Report	Quarterly	Email & FES NE website	HPT, FES NE, ATM, RM, EHO
	Quarterly Campylobacter Report	Quarterly	Email & FES NE website	HPT, FES NE, ATM, RM, EHO
	Sexual Health Bulletin (GUMCAD, CTAD, HIV, local enhanced syphilis)	Quarterly	Email & FES NE website	HPT, FES NE, SH Leads, DsPH, ATMs, GUM consultants, ID physicians, AT
	TB Report (also annual supplement)	Quarterly	Email & FES NE website	HPT, FES NE, TB leads, TB clinicians, RM, ATMs
	Care Home outbreak report	Quarterly	Email	HPT, FES NE, DsPH,
	Annual Sexual Health Report	Annual - September	Email & FES NE website	HPT, FES NE, SH Leads, DsPH, ATMs, GUM consultants, ID physicians, AT
	Annual Antenatal Infectious Disease Screening Report	Annual - October	Email & FES NE website	HPT, FES NE, DsPH, RASCO, AS Leads, AT/CCG Screening Lead
	HIV/AIDS SOPHID Regional Report	Annual – November	Email & FES NE website	HPT, FES NE, ATMs, SH Leads, DsPH, ID physicians, GUM consultants
	Annual Hepatitis B & C Report	Annual -August	Email & FES NE website	HPT, FES NE, DsPH, ID physicians, virologists, Drug action teams
IPD Annual Report	Annual - November	Email	HPT, FES NE, RM, ATMs, ID physicians, GP via CCG	

Protecting the population of the North East from communicable disease and other hazards. Annual Report 2016/17

	Output¹	Frequency	Dissemination	Email Recipients
Reports for HPT/FES NE +/- RM	EpiNorth3 Typing Coincidence Report	Daily	Email	HPT, FES NE
	EpiNorth3 Postcode Coincidence Report	Daily	Email	HPT, FES NE
	EpiNorth3 Exceedance Report	Weekly	Email	HPT, FES NE
	EpiNorth3 Weekly Team Report	Weekly	Email	HPT, FES NE
	CoSurv Regional Report & Exceedance reports	Weekly	Email & FES NE website	HPT, HPT, FES NE, RM
	EpiNorth3Postcode sector report	Weekly	Email	HPT, FES NE
	Exposures Report	Weekly	Email	HPT, FES NE
	Space-Time Cluster report	Weekly	Email	FES NE
	COVER data charts	Quarterly	Email & FES NE website	HPT, FES NE
	IPD Trend Report	Quarterly	Email	HPT, FES NE
Reports produced by FES nationally & distributed	LASER report (STI)	Annual - October	Email	DsPH, HPT
	Spotlight Report STI	Annual -August	Email	HPT, FES NE, SH Leads, DsPH, ATMs, GUM consultants, AT
	Spotlight Report HIV	Annual-December	Email	HPT, FES NE, SH Leads, DsPH, ATMs, GUM consultants, ID physicians, AT

1. EXCLUDES Internal communication reports, internal audit reports and forwarded national reports.
2. Items on the FES NE website are available to those with logins including microbiologists, DsPH, and EHOs.
3. Stakeholder reports contain data for the following organisms/diagnoses; Salmonella, E. coli O157, Campylobacter, Cryptosporidium, Meningococcal disease, other meningitis, measles, mumps, rubella, pertussis, HiB, Hepatitis A, B & C, Listeriosis, Legionella and PVL +ve Staphylococcus aureus.

Abbreviation	Description	Abbreviation	Description
AS Leads	Antenatal Screening Leads	HPT	Health Protection Team (PHEC NE)
ATMs	Acute Trust Microbiologist	ICN	Infection Control Nurses
AT	Action Team	ID	Infectious Disease
CCG	Clinical Commissioning Group	RASCO	Regional Antenatal Screening Coordinator
CPs	Chest Physicians	RM	Regional Microbiologist
DsPH	Directors of Public Health	SH Leads	AT and CCG and clinical network Sexual Health Leads

Appendix 3: The PHE Public Health Laboratory Service in Newcastle upon Tyne and York

Location and contact details

The laboratory is located at Freeman Hospital and the Royal Victoria Infirmary, Newcastle.

PHE Newcastle Regional Laboratory	Direct line:	0191 282 1150
Level 2	Or via:	0191 233 6161 (Hospital Switchboard)
Freeman Hospital	On call:	Request on-call scientist/medical officer
High Heaton	Fax:	0191 213 7289
Newcastle upon Tyne		
NE7 7DN		

Please note that food, water and environmental samples are examined in the:

PHE FW&E Laboratory
Block 10
The National Agri-food Innovation Campus
Sand Hutton
York
YO41 1LZ

Tel: 01904 468948
Fax: 01904 468082

Appendix 4: Publications and presentations (HPT and FES)

Papers published in peer review journals

- Houseman C, Hughes GJ, Chapman KE, Wilson D, Gorton R. **Increased incidence of Invasive Pneumococcal Disease, North East England, 2015/2016.** *Emerging Infectious Diseases*, 2017; 23 (1): 122-126
- Hughes G, Wright L, Chapman K, Wilson D, Gorton R. **Serotype-specific differences in short and longer-term mortality following invasive pneumococcal disease.** *Epidemiology and Infection*, 2016; 144 (12): 2654-69
- Freeman R, Dabrera C, Lane N, Adams L, Browning L, Fowler T, Gorton R, Peters T, Mather H, Ashton P, Dallman T. **Association between use of proton pump inhibitors and non-typhoidal salmonellosis identified following investigation into an outbreak of Salmonella mikawasima in the UK, 2013.** *Epidemiology and Infection*, 2016; 144 (5): 968-75
- Dolan GP, Foster K, Lawler J, Amar C, Swift C, Aird H, Gorton R. **An epidemiological review of gastrointestinal outbreaks associated with Clostridium perfringens, North East of England, 2012-2014.** *Epidemiology and Infection*, 2016; 144 (7): 1386-93
- Foster K, Cole M, Hotonu O, *et al.* **How to do it: lessons identified from investigating and trying to control an outbreak of gonorrhoea in young heterosexual adults.** *Sexually Transmitted Infections*, 2016; 92: 396-401
- De Silva D, Peters J, Cole K, Cole MJ, Cresswell F, Dean G, Dave J, Thomas DR, Foster K, Waldram A, Wilson DJ, Didelot X, Grad YH, Crook DW, Peto TE, Walker AS, Paul J, Eyre DW. **Whole genome sequencing to determine Neisseria gonorrhoeae transmission: an observational study.** *Lancet Infectious Diseases*, 2016; 16 (11): 1295-1303
- Mook P, Kanagarajah S, Maguire H, Adak GK, Dabrera G, Waldram A, Freeman R, Charlett A, Oliver I. **Selection of population controls for a Salmonella case-control study in the UK using a market research panel and web-survey provides time and resource savings.** *Epidemiology and Infection*, 2016; 144 (6): 1220-30
- Jenkins C, Kanagarajah S, Waldram A, Dolan G, Ashton P, Carrion I, Davies R, Frost A, Dallman T, De Pinna E, Hawker J, Grant K, Elson R. **Whole genome sequencing reveals an outbreak of Salmonella enteritidis associated with reptile feeder mice in the United Kingdom, 2012-2015.** *Food Microbiology*, 2017. Available from <https://doi.org/10.1016/j.fm.2017.04.005> [accessed 11/08/2017]
- Jenkins G, Waldram A, Dolan G, Ashton P, Dallman T. **Epidemiological analysis of Salmonella clusters identified by whole genome sequencing, England and Wales 2014.** *Food Microbiology*, 2017. Available from: <https://doi.org/10.1016/j.fm.2017.02.012> [accessed 11/08/2017]
- Meghji J, Simpson H, Squire SB, Mortimer K. **A systematic review of the prevalence and pattern of imaging defined post-TB lung disease.** *PLoS ONE*, 2016; 11 (8):e0161176
- Jary H, Simpson H, Havens D, Manda D, Pope D, Bruce N, Mortimer K. **Household air pollution and acute lower respiratory infection in adults: a systematic review.** *PLoS ONE*, 2016. Available from: <https://doi.org/10.1371/journal.pone.0167656> [accessed 11/08/2017]

Presentations on research to conferences

Oral presentations

- Waldram A, Ashton P, Gorton R. **Examining genetic differences in epidemiologically identified Salmonella clusters to inform prospective outbreak investigation using whole genome sequencing.** Five Nations Health Protection Conference, May 2016
- Foster K. **Investigation and management of a group B meningococcal cluster in an educational setting.** PHE Conference, September 2016
- Henderson M, Howard S. **Screening for latent tuberculosis infection in clinical healthcare workers in an NHS hospital trust.** Five Nations Health Protection Conference, May 2016

- Henderson M, Howard S. **Latent TB among clinical staff in an acute NHS Hospital Trust: a retrospective screening exercise**. British Infection Association Spring Scientific Meeting, London

Poster presentations

- Wright LB, Chapman KE, Hughes GJ, Houseman C, Gorton R, Wilson D. **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**. 10th International Symposium on Pneumococci and Pneumococcal Diseases (ISPPD) Glasgow, June 2016
- Wright L, Chapman K, Hughes GH, Houseman C, Gorton R, Wilson D. **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**. Five Nations Health Protection Conference, May 2016
- Wright L, Chapman K, Hughes GJ, Houseman C, Gorton R, Wilson D. **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**. 10th International Symposium on Pneumococci and Pneumococcal Diseases (ISPPD) Glasgow, June 2016
- Simpson H, Saunderson P, van der Grinten E, Ampadu E, Kwakye C, Odoom S, Cano-Ortega J, Biritwum NK. **Mapping of routine surveillance data to plan integrated interventions against neglected tropical diseases**. PHE Early Career Scientist Conference, 2016
- Simpson H, *et al*. **Does outbreak investigation practice explain spatial and temporal variation in the incidence of clostridium perfringens outbreaks in England?** PHE Early Career Scientist Conference, 2016
- Houseman K. **Invasive pneumococcal disease in the North East of England: Rising incidence in 2014/15 and 2015/16**. FIS November, 2016
- Henderson M, Howard S. **Screening for latent tuberculosis infection in clinical healthcare workers in an NHS hospital trust**. Annual Scientific Meeting of the Society and Faculty of Occupational Medicine, Stratford-upon-Avon, June 2016
- Howard S, Dolan G. **Care beyond commissioning: is anyone ethically responsible for providing urgent prophylaxis to patients if no-one is commissioned to do it?** Interprofessional Ethics Conference, Royal Society of Medicine, February 2017