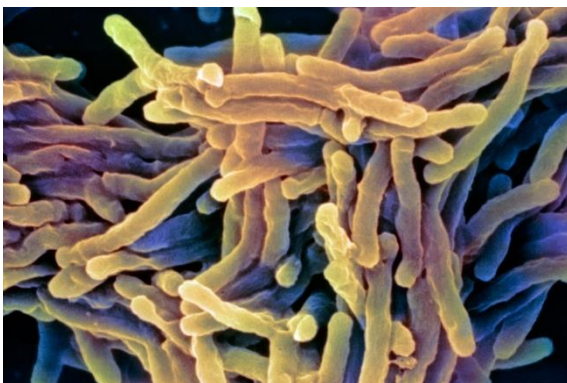




Public Health
England

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

Annual Report 2017/18



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-leading science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and a distinct delivery organisation with operational autonomy. We provide government, local government, the NHS, Parliament, industry and the public with evidence-based professional, scientific and delivery expertise and support. Website: www.gov.uk/phe. Twitter: [@PHE_uk](https://twitter.com/PHE_uk), Facebook: www.facebook.com/PublicHealthEngland.

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Foreword

Welcome to the eight 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.

2017 has been a time of transition for the North East Health Protection Team. In September, Rachael Kain and Claire Stoker started work as senior nurses covering North of Tyne and Durham/Darlington respectively. We had three vacancies in the Acute Team that have been filled by Ali Boon-Chandler, Robert Seremani and Stephen Minto.

Dr Kirsty Foster remains 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. She has also been successful in being appointed as the local Training Programme Director.

We are confident that all of the changes made to the team in the last two years will ensure that we are able to continue to deliver safe and effective health protection services across the North East.

Summary of progress on 2017/18 priorities

The HPT identified seven local high-level priorities for 2017/18, 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 2017/18.	Achieved
2	Develop a North East TB Network vision statement and action plan to support the delivery of the national TB strategy.	Achieved
3	Convene two meetings of the newly formed North East TB Network.	Achieved
4	Complete the work on developing a local AMR action plan and launch at a cross-system event.	Achieved
5	Conduct mapping exercise to understand current local patterns of prescribing to ensure effective local action planning.	Achieved
6	Conduct a review of EpiNorth3 (local health protection surveillance system)	Ongoing
7	Produce health protection annual report for 2017/18	Achieved

Priorities for 2018/19

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 2018/19 have remained the same for a number of years and therefore our objectives continue to be framed in the same way. They are listed in Table F2.

Table F2: Local priorities for 2018/19

	Priorities
1	Continue to deliver effective health protection services in 2018/19.
2	Continue to consolidate the North East TB Network
3	Deliver the 2018/19 objectives as outlined in the NE TB strategy.
4	Deliver HP/STAC update session for DsPH and public health teams
5	Provide targeted support local authorities in meeting NO ₂ reduction targets and associated activities in improving air quality.
6	Finalise the review of EpiNorth3 (local health protection surveillance system)
7	Complete outputs from the IPD project
8	Produce health protection annual report for 2018/19

1. Introduction and recent developments

1.1. This report

This is the eighth Annual Report compiled by the North East Health Protection Team and outlines the key health protection issues in 2017/18 while identifying the priorities for 2018/19. 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 has now become the Field Service (FS) but they continue to collate 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 assisting with delivery of proactive and reactive information and advice on health protection issues to the public.
- 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 Services

The North East field epidemiology team is one of eight similar teams around the country. These teams are nationally managed and co-ordinated but geographically dispersed. Their purpose is

to provide specialist epidemiological expertise to support Health Protection teams in field epidemiological investigations and surveillance.

In addition, the local field epidemiology team 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 field epidemiology team works closely with the HPT; jointly managing North East based surveillance systems and providing epidemiological components of incident investigations, in particular analytic studies.

We were delighted that Dr Petra Manley was appointed to lead the local field epidemiology team in September 2017 following the retirement of Dr Russell Gorton.

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 clinical laboratory services are located within the Newcastle upon Tyne Hospitals NHS Foundation Trust, and food, water and environmental services are delivered from the York Laboratory.

The clinical 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).

The provision of Public Health Microbiology Services (Laboratory and Professional support) has been subject to a tender process. The Health Protection Team and Field Services have had input into this process. At the time of writing this report final contract discussions were taking place with the successful organisation. During this period, arrangements remain in place 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 FS 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; teaching and examining on the Newcastle University degree programme in medicine; and providing supervised placements to a range of undergraduate and post-graduate 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.

1.7. Health protection in the prison setting

In 2017 the North East HPT and Health and Justice Public Health Specialist identified the need for a forum for the discussion and dissemination of issues relating to public health within the North East custodial estate and to further develop the public health agenda within the North East prison system. An initial Public Health in Prisons North East meeting was held in June 2017 and participants were very supportive of the approach.

Further meetings are now being chaired by one of the Consultants in Health Protection. The meetings allow for the dissemination and discussion of key material and learning relating to health protection and infection control; opportunities for individual prisons to share learning and good practise in relation to public health; CPD for prison staff and commissioners in relation to public health; strategic recommendations to the commissioners of healthcare service and others (including governors) on issues relevant to public health. In December 2017 a training session on managing outbreaks in prisons was well received by prison commissioners and providers. An audit of dental provision in prisons was presented and discussed at the April 2017 meeting.

1.8. Whole genomic sequencing (WGS)

WGS has been introduced into routine public health practice. Public Health England (PHE) are world leaders in the use of WGS for infectious diseases. From 2012, WGS pipelines have been developed and implemented for routine identification and typing of selected organisms isolated from humans. As of 2018, PHE routinely sequences human isolates of *Salmonella*, *E. coli*, *Shigella*, *Listeria* and *Mycobacterium tuberculosis* as part of its surveillance activities. Other pipelines for sequencing have been developed but are not in routine use: *Clostridium difficile*, *Neisseria gonorrhoeae*, *Campylobacter*, *Yersinia* and *Vibrio*; a pipeline for *Staphylococcus aureus* is currently under development to be incorporated into routine public health practice.

WGS of gastrointestinal organisms is now well established. Single nucleotide polymorphism (SNP) addresses are used to summarise the genetic information allowing easier interpretation. The Health Protection Team, working closely with the local field epidemiology team, has developed reports that highlight clusters of genetically similar organisms. The National GI team also produces a national overview of five SNP clusters which the local field epidemiology team also monitors for activity. In general, clusters of two or more cases within five SNPs are assessed using exposures previous collected to gauge if a common source is present.

The WGS of TB has recently been rolled out to all of England. The North has been producing WGS of TB for longer i.e. from November 2016. For TB, the nomenclature and interpretation of clusters is different to GI organisms as clusters are defined as being within 12 SNPs and are given a specific cluster number, so no SNP addresses are used. The process is also slightly

different as there are TB cluster investigators that assess the severity and speed of growth of the clusters. They also indicate when new cases are added to clusters and when public health action should be considered.

There is also a process in place to request WGS in outbreak situations where the results will directly impact the public health measures. This is used when the organism causing the outbreak is not routinely sequenced but where there is evidence to indicate the utility of WGS in the situation. Requests are peer reviewed to ascertain their scientific and practical feasibility.

WGS is fast becoming one of the most important pieces of evidence in public health investigations. Interpretation of WGS can be complex but there are resources to help with the interpretation of SNP addresses and national colleagues who can provide explanations and strength of associations in practice.

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 is 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 historical vaccine development and introduction timeline of the routine vaccine programme is shown in figure 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 2017/18:

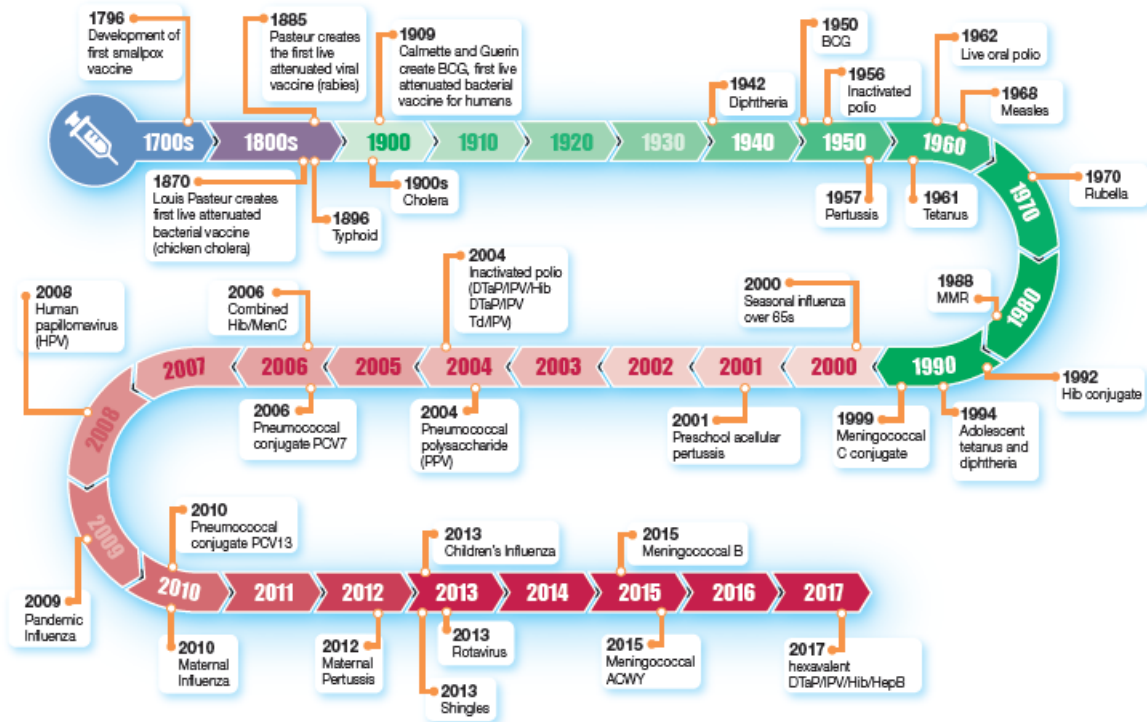
Hepatitis B at-risk (new born babies)

New born babies whose mother has Hepatitis B are at increased risk of contracting the disease. The number of recommended doses has been reduced to three, removing the third dose at 2 months. This was an in-year change effective from 30 October 2017.

Meningococcal B (Men B) infant

This programme is for three doses of vaccine at 2, 4 and 12 months (in line with the childhood immunisation programme), with a catch-up element in place for children up to 2 years who can be vaccinated on an opportunistic basis.

Figure 2.1. Historical vaccine development and introduction of the routine vaccine programme



Coverage rates

Uptake in the North East for the routine childhood programme remains among the highest in England: In Quarter 3 (Oct-Dec) 2017:

- By aged 12 months, 95.1% of children in the North East (93.1% 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% (91.1%) had received measles, mumps and rubella (MMR) vaccine (dose 1).
- By 5 years, 92.2% (87.3%) had received two doses of MMR.
- By 5 years, 91.5% (85.9%) had received diphtheria, tetanus, polio booster. (DTaP/IPV Booster)

The vaccination programme 2017/18

At the time of writing this report there was no significant change in the national programme planned for 2018/19.

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.
- 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 reporting cases and incidents of healthcare associated infections (HCAs).
- 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 common exposures and/or outbreaks.

Appendix 1 provides a summary of the main communicable disease cases reported in North East residents in 2017 and Appendix 2 a summary of the surveillance reports which are routinely provided to local authorities and other partner organisations.

Information is provided 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 meticillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-sensitive *Staphylococcus aureus* (MSSA), gram-negative bacteraemias caused by *E. coli*, *Klebsiella* spp., *P. aeruginosa* 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 and Social Care, 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 sexually-transmitted infections (STIs) and sexual health screening tests and treatments. The quality of data reported from the North East remains high.

PHE NE continues to produce quarterly STI bulletins and includes additional local information to the nationally produced Spotlight report on STIs and HIV in the North East. The annual local authority sexual and reproductive health profiles (LASERs) are produced nationally and are available through the HIV and STI Web Portal.

The GUMCAD2 system collects information on STI testing and diagnosis in GUM and non-specialist settings, including primary care. The HPT and field epidemiology team, together with the PHE NE Sexual Health facilitator, 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 March 2019.

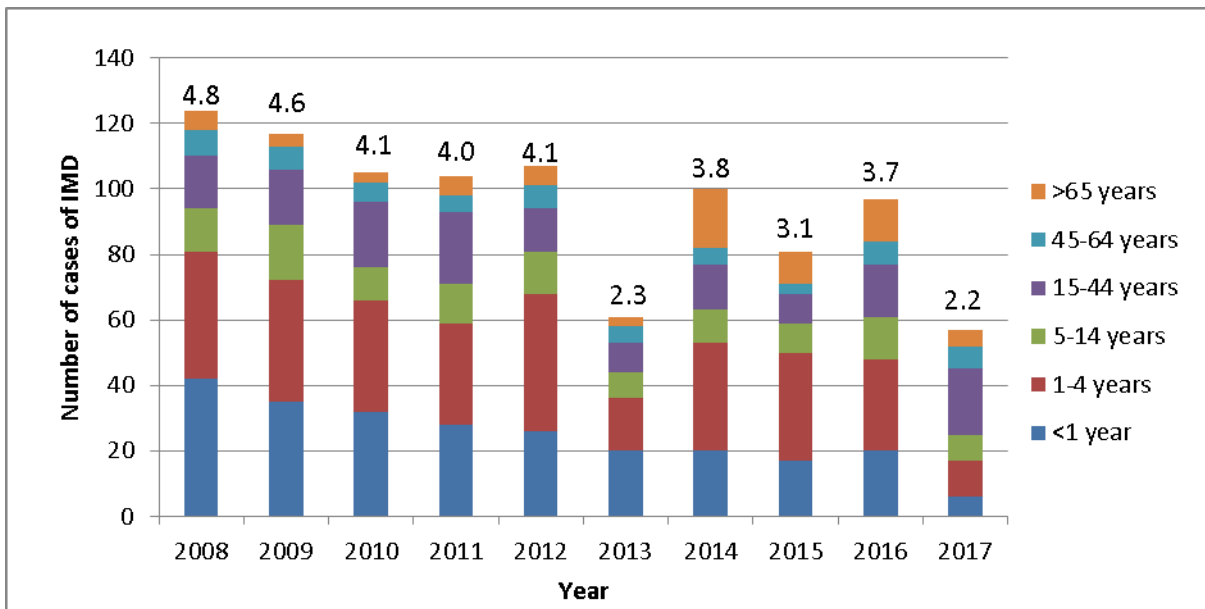
4. Control – specific diseases

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 2017.



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 2017

Local Authority	Number of cases	Rate (per 100,000)
County Durham	8	1.5
Darlington	2	1.9
Gateshead	3	1.5
Hartlepool	4	4.3
Middlesbrough	5	3.6
Newcastle upon Tyne	4	1.4
North Tyneside	2	1.0
Northumberland	3	0.9
Redcar and Cleveland	6	4.4
South Tyneside	4	2.7
Stockton-on-Tees	3	1.5
Sunderland	12	4.3
North East Total	56	2.1

*Rate uses local authority population figures for 2016

Serogroup group B still remains accountable for the majority of cases in the North East, in line with national figures. In 2017 there was a 46% reduction in Men B cases being reported compared to 2016. In 2017 there was a reduction in Men W135 cases by 70% compared to the previous year 2016. This is most likely due to the introduction of the school leavers Men ACWY vaccine programme which was initiated in 2015, due to the dramatic increase in Men W cases.

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	2017
B	83	68	53	62	48	31	33	38	39	21
W135	2	1	1	3	3	4	12	13	23	7
Y	3	1	3	0	4	3	4	4	5	2
C	1	0	0	0	3	1	2	1	5	5
Z	0	0	0	0	0	0	0	0	0	0
Ungrouped	34	45	46	34	48	22	48	25	24	21
North East Total	123	115	103	99	106	61	99	81	96	56

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 15 to 19 years old.

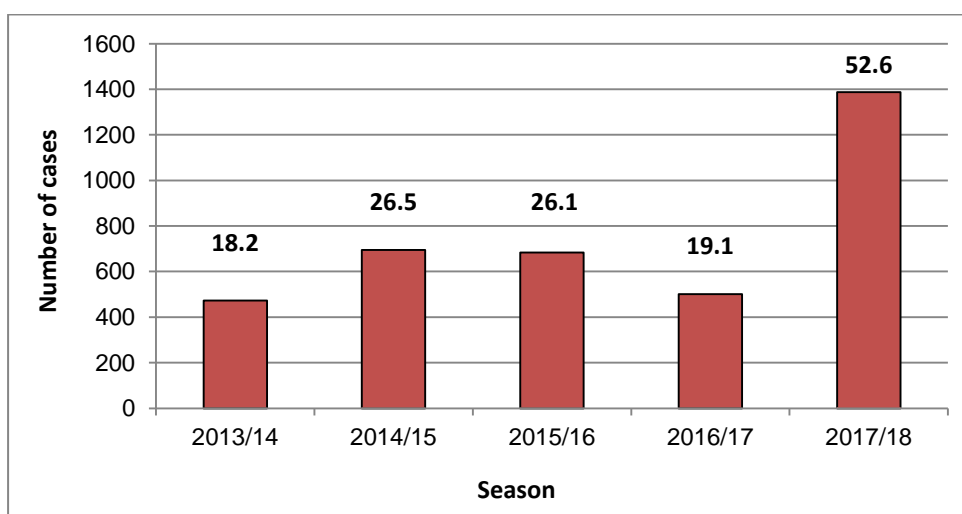
4.2. Invasive Group A streptococcal disease (iGAS) and scarlet fever

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

Scarlet fever is a rash illness caused by GAS, which mainly affects children. Although usually mild, scarlet fever can occasionally lead to serious complications, which are to a large extent preventable by treatment with antibiotics. Cases of scarlet fever are notifiable to PHE.

An increase in notifications of scarlet fever was observed in the 2014/15 season (695 cases; 26.5 per 100,000 vs. 18.2 per 100,000 in 2013/2014; Figure 4.2), with notifications remaining high in 2015/16 (684 cases). After slight decrease in notifications in 2016/17 (501 cases), there was a 177% increase in notifications in the 2017/18 season (1,388 cases; 52.6 per 100,000). This was the highest number of notifications over the past 5 seasons.

Figure 4.2: Number* of cases of scarlet fever in the North East and overall rate by season‡, from 2013/2014 to 2017/2018



* Seasonal data covers the period from week 14 to week 37.

‡ The numbers above the bars show the overall rate of cases of iGAS per 100,000 in the North East.

Quarterly notifications of scarlet fever were higher in Q1-Q3 2016 than during the same period in 2015 (Table 4.3). In 2016 there were 1,131 notifications: around 20% more than in 2015 and an increase of five cases on the previous peak in 2014. In 2017 the number of notifications remained above expected levels, but a decrease was observed in the total number of cases when compared with 2016. Notifications began to increase in Q4 2017 with a 138 % increase observed when compared with Q4 2016. This increasing trend in notifications continued in Q1 2018, with 949 cases reported; a 207% increase from Q1 2017 and the highest number of cases reported in the previous six years.

Table 4.3: Scarlet fever notifications to NE PHE Centre, Quarter 1 2013-2018

Year	Quarter				Total
	1	2	3	4	
2013	193	127	30	72	422
2014	330	498	112	203	1,143
2015	466	243	85	162	956
2016	491	367	127	146	1,131
2017	309	189	128	348	974
2018	949				

Data from EpiNorth3. Cases by referral date.

Note that there are small differences to figures quoted in previous annual reports for pre-2018 data due to additional data cleaning and case reclassification which has been undertaken in 2017/18.

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. The infection is serious, 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.

The incidence of iGAS in the NE rose significantly in 2013 and has remained elevated with a peak of 167 cases reported in 2015. In 2017, 122 cases were reported, which represents a slight decrease from 2016 (161). As with scarlet fever notifications, there was a substantial increase in cases in Q1 2018, with 78 notifications in Q1 2018 compared with 28 in 2017. This was slightly higher than the previous peak in notifications in Q1 2016.

Table 4.4: Invasive Group A streptococcal disease reported to NE PHE Centre, Quarter 1 2013-2018

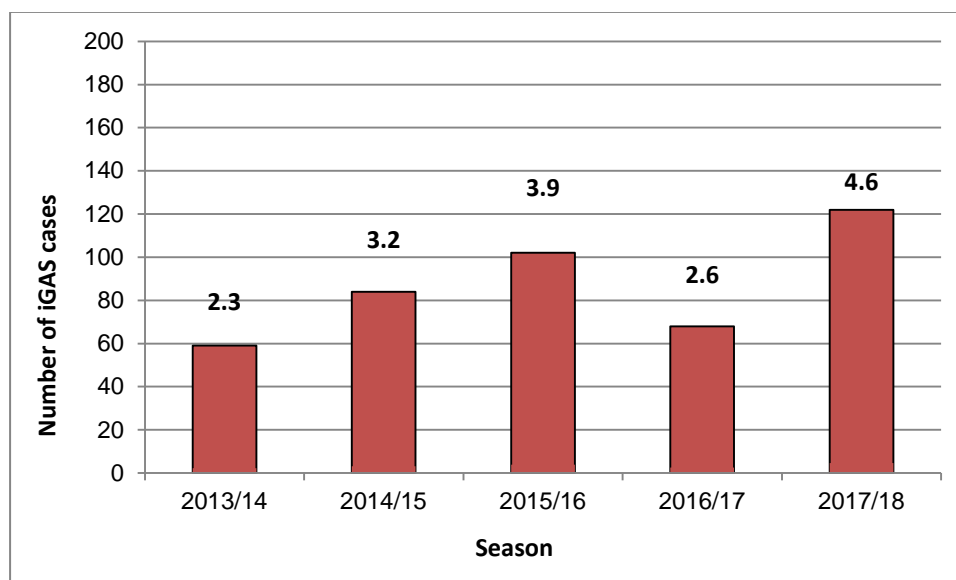
Year	Quarter				Total
	1	2	3	4	
2013	36	56	14	24	130
2014	30	32	25	21	108
2015	51	54	29	33	167
2016	63	45	25	28	161
2017	28	30	29	35	122
2018	78				

Data from HPZone. Cases by referral date.

Note that there are small differences to figures quoted in previous annual reports for pre-2018 data due to additional data cleaning and case reclassification which has been undertaken in 2017/18.

iGAS infections have a seasonal pattern with the highest incidence from December to April. Since 2013/2014 there has been an increase in the number of iGAS cases with the exception of 2016/2017. However, the rate of cases rose substantially in 2017/2018 to 4.6 per 100,000.

Figure 4.3: Number of cases of invasive Group A Streptococcus (iGAS) in the North East and overall rate[‡] by season*, from 2013/2014 to 2017/2018



* Seasonal data covers the period from week 14 to week 37.

‡ The numbers above the bars show the overall rate of cases of iGAS per 100,000 in the North East.

4.3. Gastrointestinal infections including food poisoning

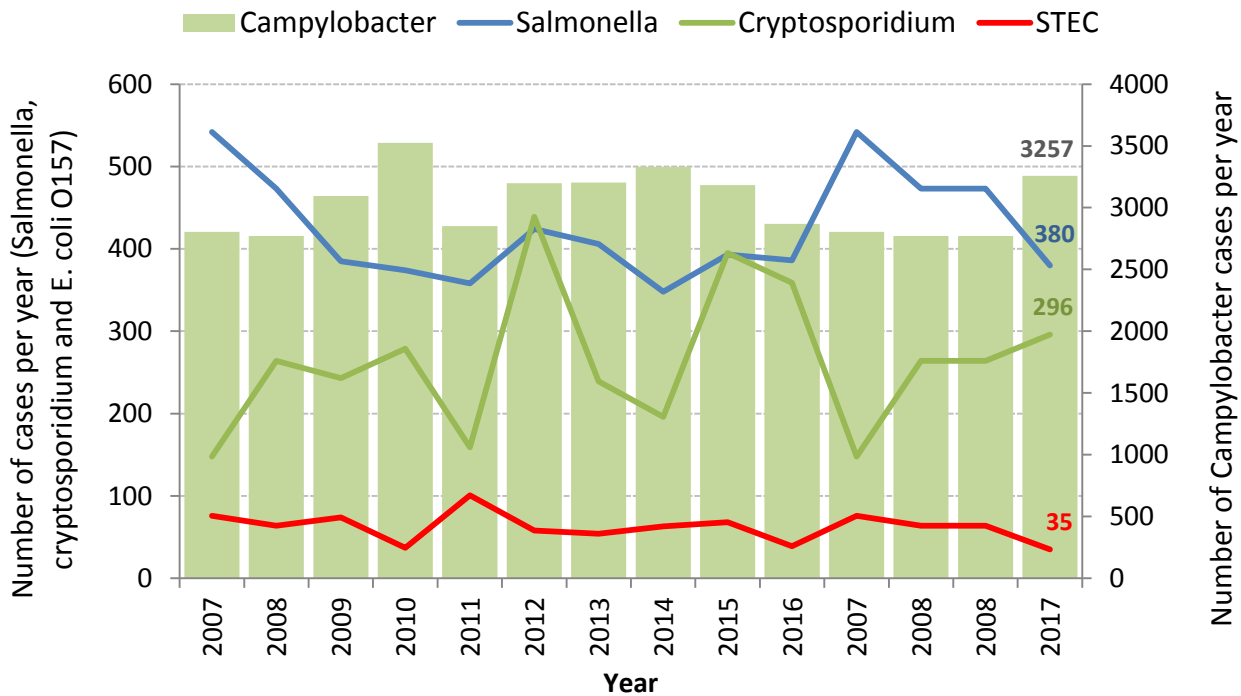
A number of organisms can cause gastrointestinal infection of which campylobacter and salmonella are the bacteria most commonly identified by laboratories. A large number of viral gastrointestinal infections occur but most are never laboratory confirmed as symptoms are usually short-lived. Food poisoning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

Shiga toxin-producing Escherichia coli (STEC) 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 STEC 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 STEC infection in the North East each year is relatively small (35 cases in 2017), but the prevention of cases remains very important due to the risk of severe illness. Every case of STEC is rigorously investigated by the HPT and the relevant local authority environmental health officers. In 2017 there were no serious outbreaks of STEC in the North East but there were a number of family clusters of cases.

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 388 more cases in 2017 compared to 2016 (3,257 vs 2,869). Case numbers have fluctuated between 2,772 and 3,525 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.

Figure 4.4: Reported cases of campylobacter, cryptosporidium, salmonella and VTEC infection in North East residents from 2007 to 2017



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 2017 there were no significant outbreaks of cryptosporidiosis in the North East.

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 2017/18.

Seasonal influenza

Moderate to high levels of influenza activity were seen in the community in England during the 2017-18 season with co-circulation of influenza B and influenza A(H3).³ Weekly rates of GP consultations for influenza like illness (ILI) were higher and exceeded the baseline threshold for longer (week 51 2017 to week 12 2018) when compared with the 2016-17 season (figure 4.5).³ Activity peaked in week 03 2018 at 54.1 per 100,000 population which was the highest peak since the 2010/11 season.³

A very high impact was seen in acute trusts in terms of laboratory confirmed hospital and ICU/HDU admissions.³ Hospital activity peaked in week 02 of 2018 and was higher than the previous 6 seasons.³ Just over half (52%) of admissions to ICU/HDU were due to influenza A with the remainder due to influenza B.³ Of those influenza A viruses that were typed, the majority were influenza A(H3N2).

Overall, influenza B positivity peak in week 02 2018 with the highest age specific positivity seen in 5-14 year olds and influenza A(H3) positivity peaked in week 52 2017 with the highest age-specific positive in the 65+ age group.³ The majority of circulating B strains were antigenically similar to the Northern Hemisphere quadrivalent vaccine strain and the majority of circulating A(H3N2) and A(H1N1) strains similar to the Northern Hemisphere trivalent/quadrivalent vaccine strains.³

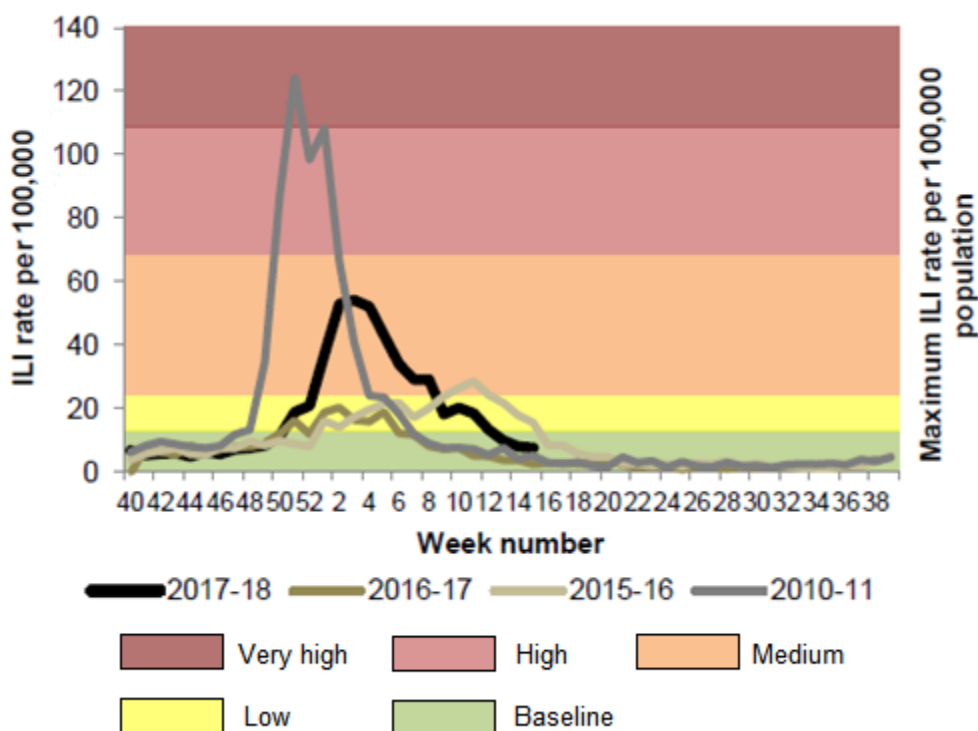
In common with previous A(H3N2) dominated seasons the impact was predominantly seen in older adults with most reports of respiratory outbreaks originating from care homes and the majority of admissions being in adults aged 65+ years. Between week 40 2017 and week 15 2018, 2,095 outbreaks of acute respiratory illness were reported in the UK to PHE (of which 1,650(78.9%) occurred in care homes) compared to 1,114 in 2016/17.³ In the North East a total of 49 outbreaks of influenza like illness were reported during the 2017/18 season, the majority (47) of which were in care homes/centres.

A total of 320 confirmed influenza deaths were reported in England between week 40 2017 and week 15 2018.³ Levels of excess all-cause mortality were similar to the 2016 to 2017 season but lower than the 2014 to 2015 season in which influenza A(H3) and influenza B also dominated.³

³ PHE. Surveillance of influenza and other respiratory viruses in the UK: Winter 2017 to 2018. May 2018. Available at:

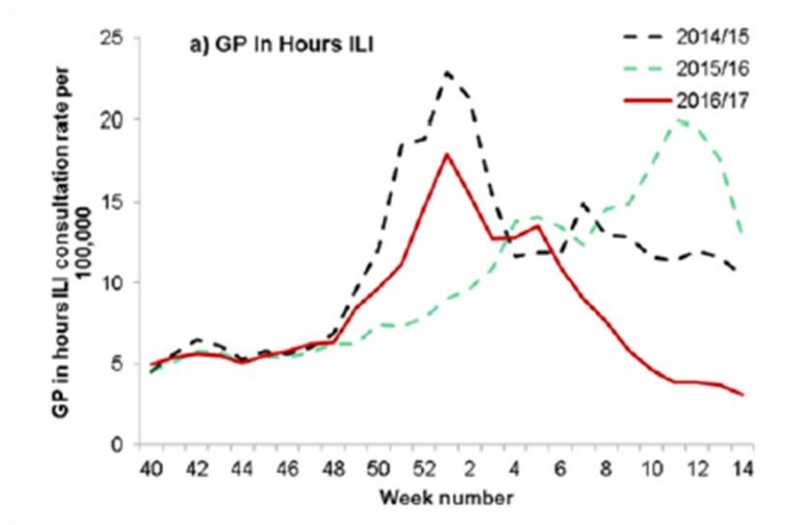
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/710483/Surveillance_of_influenza_and_other_respiratory_viruses_in_the_UK_2017_to_2018.pdf

Figure 4.5: Weekly all age GP influenza-like illness rates for 2017 to 2018 and past seasons, England (RCGP). Source: Adapted from PHE Flu annual report: winter 2017 to 2018



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.³ 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).³ 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.³

Figure 4.6: GP in-hours consultation rates for ILI winter 2016 – 2017.



Pandemic influenza

A pandemic of influenza infection may occur when a new flu virus circulates to which few people have any existing immunity. No specific pandemic influenza preparedness activities have been held in the North East since September 2017 although national LRF pandemic flu workshops were attended by colleagues from the North East LRFs.

Avian influenza

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

In 2017/18 a number of wild bird incidents of influenza A(H5N6) were reported across different PHE Centres in England. Sequencing data suggest that these viruses were of a European lineage not associated with cases of human illness to date and distinct from the more pathogenic strain seen in Asia.

No incidents have been reported in the North East in the 2017/18 season. There continue to be challenges in arranging the prompt sampling of exposed and symptomatic persons and arrangements for the prescription and dispensing of anti-viral prophylaxis to those exposed to avian influenza which are being discussed with NHS England.

Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV)

The World Health Organisation (WHO) first reported cases of MERS-CoV in September 2012.³ 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. In 2017/18, three possible cases of MERS-

CoV were reported to the North East HPT all of whom tested negative. No positive cases have been reported in the UK since February 2013.

4.5. Surveillance of sexually transmitted infections (STIs) and HIV

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 60% 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.

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 Spotlight reports on STIs and HIV. Data presented in this section are from 2017, the most recent published STI and HIV figures (available <https://www.gov.uk/government/statistics/sexually-transmitted-infections-stis-annual-data-tables> and <http://fingertips.phe.org.uk/profile/sexualhealth>)

During 2017/18 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 and training.

Overall numbers of STIs in the North East in 2016

There were 18,121 new diagnoses (9540 M; 8567 F) of STIs in the North East in 2017, a slight increase (2%) from 2016. The overall rate is 687 / 100, 000 population (lower than the England rate of 762 / 100, 000). Within the region, rates at local authority level range from 473 per 100, 000 to 1,194 per 100,000 residents). The rate of new STIs in younger adults are much higher (> 3,000 / 100,000 in both 15-19 year and 20-24 year age groups) and 95% of diagnoses are made in people of white ethnicity. The rates of new STIs are similar in women and men (702 and 649 per 100 000 residents respectively). There is more detail on these data in the Spotlight on STIs report.

Chlamydia

Chlamydia remains the most common STI in the region. The number of chlamydia cases diagnosed in North East residents increased by 6% in 2017 (8,554 cases) compared to 2016 figures (8,947), the rate of infection (362 per 100,000 population) is slightly lower than the overall England rate (367/100,000).

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.

Gonorrhoea

The number of gonorrhoea cases continued to increase in the North East with a 3% rise from 1,738 cases in 2016 to 1,815 cases in 2018; although the increase has slowed compared to previous years it is important to recognise that there has been a 39% increase since 2013. Over half of the cases (1,016 cases) were in men and within this group 525 were in men who have sex with men (MSM).

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 rose by almost 30% in 2017, from 156 cases in 2016 to 206 cases in 2017. This continuing rise follows 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.

There are increasing number of cases in older residents (>45y old men and women). Although new diagnoses are still predominantly seen in MSM (170 / 206 new cases), a greater number of cases are also being seen in heterosexuals and the number of female cases (36 cases) was the highest since 2013.

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 2016 (the latest data available) 142 people were newly diagnosed with HIV; this was the highest number of new diagnoses since 2012. This brought the total of people living with HIV in the North East to 1,797.

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-seven per cent of newly diagnosed cases of HIV in 2016 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 2016 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.

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.

All 12 local authorities in the North East continue to participate in the HIV Home sampling programme; a nationally coordinated project, which aims to increase testing in high risk, hard to reach groups and so aid earlier diagnosis of HIV in these groups. 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 2017 a total of 14 cases of acute infection were reported in the North East (see table below) compared to 16 cases in 2016, 8 cases in 2015, 16 cases in 2014 and 17 cases in 2013. The median age of cases was 44.5 years. Sexual transmission was the most likely route of exposure for 11 (79% of cases), with these cases reporting sex between men and women as the most likely source. During 2017, 200 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.

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 (DAA) 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. In 2017, 465 newly detected hepatitis C cases were reported to the North East HPT, giving a rate of 17.8 per 100,000. This was considerably higher than the regional rate reported in 2016 (9.2 per 100,000), and was the highest rate reported in the 2013-2017 period, reversing a general decreasing trend in reporting in the region since 2012. It is important to note that changes in the number of laboratory reports of HCV may be reflective of changes in testing uptake and reporting, rather than variation in disease incidence.

Table 4.5: Acute Hepatitis B cases reported to the North East Health Protection Team in 2017

	Male	Female	Total
Number (%)	7 (50%)	7 (50%)	14
Median age (range)	48.5 (19-63)	44 (23-56)	44.5 (19-63)
Ethnicity			
- White British	6	5	11
- Unknown	1	2	3
Most likely place of transmission			
- UK	2	5	7
- Outside UK	1	0	1
- Not known	4	2	6
Most likely Source			
- Heterosexual sex	5	6	11
- Sex between men	0	0	0
- Unknown/other	2	1	3

In England, against a background of rising HCV-related mortality that was predicted to increase in the future, the first fall in deaths in over a decade has been sustained with a 3% fall in deaths from HCV-related end-stage liver disease and hepatocellular carcinoma between 2014 and

2016. This suggests that increased treatment with new DAA drugs may be starting to have an impact.

As in previous years, our 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, HIV and syphilis) has been successfully implemented in all North East prisons. PHE North East continues to actively support the North East and Cumbria Hepatitis C ODN to ensure effectively delivery of treatment in the region.

4.7. Tuberculosis

There were 110 cases of TB reported to the Enhanced Tuberculosis Surveillance System (ETS) in North East residents for the calendar year of 2017 (provisional data), which is slightly lower than the finalised figure for the calendar year of 2016 (124). As TB treatment typically takes many months to complete, and many cases require extensive contact tracing and screening, these incidence figures somewhat under-represent the amount of work done by TB services across the North East.

On the basis of the finalised 2016 data, the North East remains one of the lowest incidence regions in England, with 4.7 cases per 100,000 population (compared with an incidence in England of 10.2 cases per 100,000 population). However, this figure masks considerable in-region variation: for example, Newcastle has 15.7 cases per 100,000 population, and Middlesbrough 9.3 per 100,000. The North East incidence of TB in UK-born children, which is used as a proxy for recent UK transmission of TB, is 0.9 per 100,000 – half the comparable figure for England (1.8 per 100,000).

However, 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.

The cohort of TB patients in the North East has its specific challenges, 16% have identified social risk factors (vs 11% in England as a whole); and 4.9% have HIV co-infection (vs 3.8% in England as a whole). Despite this, compared to the figures for England, the median time from onset of symptoms to starting treatment is shorter, and a smaller proportion of TB patients in the North East are lost to follow-up. Most North East pulmonary TB cases complete their treatment within 12 months. This is testament to the hard work undertaken and effective therapeutic relationships built by TB teams across the North East. Successful treatment on the first attempt contributes to the low incidence of antibiotic resistant TB in the North East (3% of cases).

Almost half of TB cases in the North East (42%) are from the White ethnic group, and a high proportion of these cases were UK-born. A greater proportion of UK born cases than non-UK born cases have pulmonary TB (71% vs 49%) with an attendant risk of transmission to others, and the average time from symptom onset to diagnosis is also longer in UK-born cases than non-UK born cases. As a result of this, we wrote to GPs across the North East highlighting the possibility of TB diagnoses in UK-born residents, and sharing the details of their local TB

nursing team. This was backed up by some targeted social media work which received good levels of engagement.

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.

We have continued to have good levels of engagement from clinical teams in the North East TB Network, which was re-established in 2016. This 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 to clinically defined risk groups aged 2-64 years.

As reported in previous Annual Reports the North East Health Protection Team and Field Services have been conducting enhanced surveillance on IPD since 2006. After ten years of collecting data this has now ceased and over the next twelve months the data will be analysed and a series of final reports produced. The 2018/19 Annual report will contain a summary of the key findings of this research.

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.

The local field epidemiology team supports the collection of surveillance data on a number of commonly healthcare-associated infections using a number of systems, as discussed in Chapter three. The data generated through these systems is then adopted by the NHS. For organisms such as *Clostridium Difficile* and Carbapenemase Producing Enterobacteriaceae (CPE), a complex set of rules and appeals are applied to this data, through which NHS 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.

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 2017/18 the HPT supported Trusts with outbreaks of influenza and norovirus. The HPT also provides public health input into Infection Prevention and Control Committees across all acute and mental health Trusts in the North East.

4.10. Antimicrobial Resistance

Antimicrobial resistance remains a growing threat to public health. A wide range of factors, including indiscriminate use of antibiotics in medicine and wider society over many years, mean that antimicrobial resistance is now reaching a critical point.

NHS England has the primary leadership role for managing the health aspects of antimicrobial resistance. In the North East, PHE supports the antimicrobial resistance agenda through surveillance and local expert advice. In March 2018, PHE arranged a regional cross-system educational event on antimicrobial resistance which was well-attended and highly rated by participants.

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 NHS 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.

Nationally and internationally, there is an increasing focus on blood stream infections caused by gram negative bacteria, frequently referred to as Gram Negative Blood Stream Infections (GNBSI). There are fewer antibiotic options for gram negative organisms and the proportion of gram negative organisms resistant to existing antibiotics is growing. New Quality Premiums have been introduced for CCGs, encouraging them to reduce the total number of GNBSIs in their population. In addition, there is a Government ambition to reduce the number of healthcare associated GNBSIs by 50% by 2020.

Carbapenemase-producing enterobacteriaceae (CPE) are 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 Service on behalf of the NHS.

5. Control - responding to communicable disease outbreaks and incidents

5.1 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.

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) and 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.

5.2 Numbers and types of incidents

In total, in 2017/18, the NE HPT was involved in investigating and where necessary managing **168** community outbreaks, incidents and clusters (including non-GI care home incidents). There were also **327** outbreaks of gastrointestinal illness in care homes, compared with **250** in 2016/17.

This involved **18** incident /outbreak control teams being established by the HPT (19 in 2016/17). These incidents/outbreaks comprised a range of pathogens including norovirus, salmonella, campylobacter, influenza, pneumococcal disease, hepatitis A and tuberculosis.

There was also a range of different premises involved including schools, hotels/restaurants, pubs, activity centres, care homes and a butcher's shop.

Particular outbreaks of note were:

- A salmonella outbreak linked to a butcher's shop
- A salmonella outbreak linked to a restaurant
- Two norovirus outbreaks linked to the same activity centre
- Two combined influenza and pneumococcal outbreaks in care homes
- A campylobacter outbreak linked to a hotel

5.3 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 2017/18 the HPT provided support in **12** significant incidents (compared with 19 in 2016/17, 19 in 2015/16, 16 in 2014/15 and 21 in 2013/14).

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 – 105
- 2014 – 90
- 2015 – 72
- 2016 – 83
- 2017 – 56
- 2018 – 44 up to 31/03/18

5.4 Gastrointestinal illness in care homes

In 2017/18 there were 327 outbreaks of GI illness in care homes compared with 250 in 2016/17, 275 in 2015/16, 328 in 2014/15, 259 in 2013/14 and 346 in 2012/13 (based on date of report).

The outbreaks comprised:

- **270** probable/ confirmed Norovirus
- **33** Sapovirus
- **11** Rotavirus
- **7** probable/confirmed Clostridium perfringens
- **2** Astrovirus
- **2** Campylobacter

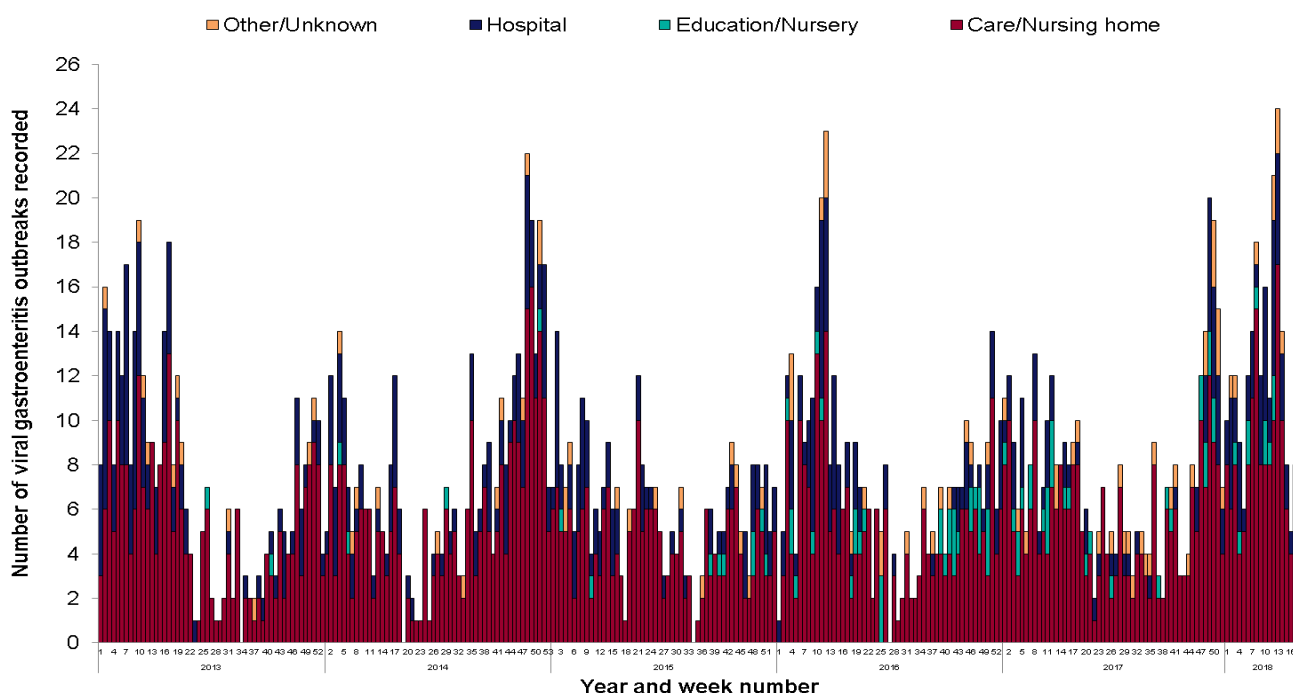
- 1 Adenovirus
- 1 unknown

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

5.5 Overview of gastrointestinal infectious disease outbreaks

As part of routine winter surveillance, the local field epidemiology team provides a weekly report on gastrointestinal infectious diseases (figure 5.1 next page). This shows all gastrointestinal infectious disease outbreaks across the North East, demonstrating the variation seen by season and also between years.

Figure 5.1: All reports of gastrointestinal infectious disease outbreaks (suspected or confirmed) by setting in North East week 1, 2013 to week 18, 2018



6. Emergency preparedness, resilience and response (EPRR)

6.1. Preparedness

Structures and processes

The PHE Centre 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 PHE 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. The 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 PHE Centre is represented on the three multi-agency Local Resilience Forums (LRFs) at strategic, tactical and sub group levels. The NE LRFs (Northumbria, County Durham & Darlington and Cleveland) coordinate planning, training and exercising in relation to a range of threats identified in their community risk registers. Development of cross LRF working within the NE has continued throughout 2017/18 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.

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

The PHE Centre 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 risk, sustainability and seasonal flu.

Plans

The PHE 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 PHE 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 as well as the nuclear power station at Hartlepool which is required to produce a plan under the Radiation Emergency Preparedness and Public

Information Regulations (REPPiR). The PHE Centre continues ensure that COMAH and REPPiR 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 is currently leading in the development of a new NE CBRN Tactical Framework with colleagues across the NE and internally worked on a national project to standardise Incident Coordination Centre (ICC) planning.

Exercises and training

PHE Centre staff are actively engaged in supporting the planning and management of multi-agency exercises across the region. In 2017/18, these exercises included a range of scenarios such as terrorist attack, rabies, cyber-attack and loss of power. Exercises are at either tactical or strategic level.

Internally the PHE Centre has played into a national exercise to test the new National Incident and Emergency Response Plan along with a workshop looking at business continuity in the case of a widespread power outage.

In 2017/18 the annual STAC update offered to Directors of Public Health and the annual Health Protection update for local authority public health staff were combined into a single full day event. This event was successfully delivered in May 2017 covering outbreak case studies, influenza and lessons learned from STAC exercise among other topics.

Internally within the Centre training is regularly delivered on EPRR Awareness for all staff and the PHE Centre led on the development of new standardised national ICC training modules.

LHRP Audit

In July 2017 a letter was sent to LHRP co-chairs across the country from PHE, NHS England and the Association of Directors of Public Health requesting LHRPs to participate in an assurance exercise. This assurance exercise was the result of a House of Commons Select Committee report on the public health system post 2013 publicised in September 2016. The questionnaire provided covered health protection capabilities such as outbreak response, radiation and avian influenza. The PHE Centre worked closely with NHS England Cumbria and the North East and the local health system to agree a response to the audit which was open and honest. Following submission of the NE response, the LHRP has agreed to review areas reported as partial or noncompliance with a view to adding to the LHRP work plan any appropriate local solutions. We are currently awaiting responses from national teams on areas highlighted in our response as being national issues. It is expected that this audit will be repeated in 2018/19.

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 2017/18, the majority of alerts received by the EPMs required an initial risk assessment only, with no further action required to protect the population. There were however a number of more significant incidents requiring acute HPT response including fires at waste recycling facilities and a chemical incident.

7. Communications team

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

During 2017/18 the team worked closely with communication colleagues in our North East local authorities and NHS England via the public health communications network and wider communication set-ups.

The team has actively supported the management of outbreaks and incidents and is a key member of outbreak/incident control teams. This has included support for "high interest" outbreaks of campylobacter, salmonella and cryptosporidium. The team has supported multi-agency responses to TB within various community settings; including supporting social media work to raise awareness of late diagnosis. Media interest and public concern around seasonal influenza was particularly heightened in 2017/2018 and the team supported the dissemination of reassurance messaging and national data both publically and via stakeholder engagement.

It has also supported local and national outbreaks of measles, norovirus, and scarlet fever and prepared communication plans to address concerns and raise awareness. 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 floods.

Severe weather incidents across the year have been supported by the communications team who have cascaded appropriate emergency planning messaging with stakeholders for incidents such as the extreme cold weather experienced this winter.

The team, working in partnership with public health communications network facilitates mutual support and shared learning and this partnership is instrumental in providing key public relations support to a range of national marketing campaigns such as Keep Antibiotics Working, Smokefree NHS, Stay Well This Winter, Stoptober, One You, Be Clear on Cancer and Change4Life. As well as supporting national campaigns and initiatives the team works closely with north east communications colleagues to support a range of local initiatives and campaigns.

8. Environmental issues

Public Health England supports stakeholders including members of the public in responding to both acute and chronic non-infectious environmental public health issues.

The Environmental Hazards and Emergencies (EHE) department is a front-line department within the Centre for Radiation, Chemicals and Environmental hazards (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: energy from waste ('incinerators'), onshore oil and gas (e.g. shale gas), long running fires and high risk waste sites.

Despite improvements in air quality over recent decades, air pollution still has a significant effect on public health in England. Short-term exposure can cause a range of effects including exacerbation of asthma, effects on lung function, increases in hospital admissions and mortality. Long-term exposure reduces life-expectancy, mainly due to increased risk of mortality from cardiovascular and respiratory causes as well as from lung cancer.

Given the threat posed to the public's health by air pollution it is one of our top priorities to research, highlight and address. We are working with Government departments, local authorities, and the wider health community in support of the Government's ambition to reduce the burden of air pollution on public health. Nationally, PHE has been commissioned by Government to review the evidence for effective and cost-effective interventions in a variety of domains and provide practical recommendations for actions that will significantly reduce harm from air pollution and this work is ongoing.

The EHE department covers all of England - the support listed below is specific to the North East. In 2017/18 CRCE EHE and the HPT have:

- Supported local authorities in developing business cases for work plans to address nitrogen dioxide exceedances, and ideally in parallel deliver wider health co-benefits by encouraging active travel and reducing the burden of air pollution more generally.
- With the Health and Wellbeing team, provided evidence base support for the Healthy New Towns programme, with Darlington being one of the ten demonstrator sites.
- Provided support and advice in relation to health risks from a proposed gasification "energy from waste" plant.
- CRCE have provided 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.
- Provided support and responses on chemical incidents and enquiries on a range of subjects including water contamination, fires at industrial premises, and chemical exposures in various settings. Prompt advice regarding decontamination minimises health and health

systems impacts. Contaminated land and chronic exposure cases may require input over a number of months, usually with expert assistance from PHE communications staff.

- 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 plastics manufacturer.
- CRCE have updated or provided new initial reference sheets for COMAH sites as their off-site plans are updated, 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.
- Developed scenarios for local and national exercises and supported the Health Protection Team in exercises with Scientific Technical Advice Cells for white powder and COMAH incidents.
- Delivered training at local universities.
- Provided training to Health Protection staff, in particular to Specialist Trainees.
- With the Environment Agency, delivered a training day on contentious sites for public health trainees, with guests from local authority Environmental Health teams to provide additional case studies and context.
- Worked with the North East Ambulance Service and the Environment Agency to develop an experiment to provide better risk assessments for chemically contaminated patients.
- Worked with Northumbrian Water in formulating a study to evaluate and improve awareness of lead sources for new mothers utilising a “making every contact count” approach via health visitors.

9. Improving the quality of health protection services

9.1. User satisfaction survey

The HPT have routinely surveyed users of the service since 2012. Questionnaires are sent to evaluate one in every ten enquiries. A total of 165 questionnaires were posted in 2017 and 115 returned (69%).

A summary of the key findings are as follows:

- 90% had contacted the HPT either once or twice in the previous 12 months.
- 98% said they were given the appropriate amount of information.
- 98% said that they had understood the advice given 'a lot' or 'completely'.
- 99% said that they had confidence in the response from the health protection nurse/practitioner.
- 97% of responders rated their overall satisfaction as either good, excellent or above average.

These scores represent an even higher level of satisfaction than was reported last year and reflect the positive experience people have when interacting with the team.

9.2. Research and Development

As in previous years, in 2017/18 the HPT and the local field epidemiology team 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 2017/18 included:

- Papers in peer review journals – 9
- Oral presentations at national/international conferences – 1
- Poster presentations at national/international conferences – 6

Further details of publications are included in appendix 4.

Appendix 1: Notifications and other reports of infectious disease in North East residents in 2017

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	20	3.8	344	65.9	2	0.4	8	1.5	81	15.5
		Darlington	6	5.7	15	14.2	6	5.7	2	1.9	10	9.5
		Total	26	4.1	359	57.2	8	1.3	10	1.6	91	14.5
	North of Tyne	Newcastle upon Tyne	6	2.0	276	93.1	0	0.0	4	1.3	51	17.2
		North Tyneside	9	4.4	103	50.7	1	0.5	2	1.0	28	13.8
		Northumberland	9	2.8	124	39.2	5	1.6	3	0.9	50	15.8
		Total	24	2.9	503	61.7	6	0.7	9	1.1	129	15.8
	South of Tyne & Wear	Gateshead	13	6.4	108	53.6	2	1.0	3	1.5	41	20.3
		South Tyneside	8	5.4	33	22.1	0	0.0	4	2.7	26	17.4
		Sunderland	10	3.6	49	17.6	1	0.4	12	4.3	54	19.4
		Total	31	4.9	190	30.2	3	0.5	19	3.0	121	19.2
	Tees	Hartlepool	7	7.5	10	10.8	0	0.0	4	4.3	1	1.1
		Middlesbrough	11	7.8	37	26.4	3	2.1	5	3.6	5	3.6
		Redcar and Cleveland	8	5.9	26	19.2	0	0.0	6	4.4	1	0.7
		Stockton-on-Tees	19	9.7	56	28.6	0	0.0	3	1.5	12	6.1
		Total	45	8.0	129	22.9	3	0.5	18	3.2	19	3.4
	Total		126	4.8	1,181	44.8	20	0.8	56	2.1	360	13.7
	England & Wales	Total	1693 ²	2.9	7,722 ²	13.2	362 ²	0.6	657 ²	1.1	3302 ²	5.7

1 Data source: EpiNorth3, 2017 data, Diagnosis (confirmed, probable and possible cases)

2 Data source: NOIDS, 2017 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 2017 data for England only

4 SGSS, 2017 data. Includes cases confirmed by NHS laboratories only.

5 Data source: HPZone 2017 data for England only. Includes reported infections of hepatitis A, B, C and E.

6 Data source: Enhanced Tuberculosis Surveillance (ETS), 2017 data.

7 Data source: Enhanced Tuberculosis Surveillance (ETS), 2017 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)

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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	10	1.9	83	15.9	675	129.3	77	14.7	5	1.0
		Darlington	0	0.0	26	24.6	143	135.4	11	10.4	0	0.0
		Total	10	1.6	109	17.4	818	130.3	88	14.0	5	0.8
	North of Tyne	Newcastle upon Tyne	2	0.7	41	13.8	345	116.4	32	10.8	1	0.3
		North Tyneside	3	1.5	22	10.8	258	126.9	11	5.4	1	0.5
		Northumberland	3	0.9	30	9.5	393	124.4	35	11.1	1	0.3
		Total	8	1.0	93	11.4	996	122.1	78	9.6	3	0.4
	South of Tyne & Wear	Gateshead	1	0.5	36	17.9	177	87.8	23	11.4	0	0.0
		South Tyneside	3	2.0	20	13.4	125	83.7	17	11.4	0	0.0
		Sunderland	1	0.4	38	13.7	238	85.6	37	13.3	0	0.0
		Total	5	0.8	94	14.9	540	85.9	77	12.2	0	0.0
	Tees	Hartlepool	0	0.0	14	15.1	117	126.1	8	8.6	1	1.1
		Middlesbrough	3	2.1	27	19.2	257	183.1	15	10.7	1	0.7
		Redcar and Cleveland	5	3.7	22	16.2	268	197.9	18	13.3	4	3.0
		Stockton-on-Tees	1	0.5	25	12.8	260	132.9	12	6.1	0	0.0
		Total	9	1.6	88	15.6	902	159.8	53	9.4	6	1.1
	Total		32	1.2	384	14.6	3,256	123.5	296	11.2	14	0.5
	England & Wales	Total	666 ³	1.2	9,631 ⁴	16.5	57,462 ⁴	98.4	4,624 ⁴	7.9	316 ⁴	0.5

1 Data source: EpiNorth3, 2017 data. Confirmed diagnosis.

2 Data source: NOIDS, 2017 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 2017 data for England only

4 SGSS, 2017 data. Includes cases confirmed by NHS laboratories only.

5 Data source: HPZone 2017 data for England only. Includes reported infections of hepatitis A, B, C and E.

6 Data source: Enhanced Tuberculosis Surveillance (ETS), 2017 data.

7 Data source: Enhanced Tuberculosis Surveillance (ETS), 2017 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)

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Region	Sub Region	Local Authority	Disease									
			Hepatitis A ¹		Hepatitis B ¹		Hepatitis C ¹		Hepatitis E ¹		TB ⁶	
			No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
North East	County Durham & Darlington	County Durham	3	0.6	14	2.7	56	10.7	4	1	8	1.5
		Darlington	0	0.0	5	4.7	19	18.0	0	0.0	2	1.9
		Total	3	0.5	19	3.0	75	11.9	4	0.6	10	1.6
	North of Tyne	Newcastle upon Tyne	4	1.3	53	17.9	52	17.5	8	2.7	32	10.8
		North Tyneside	1	0.5	9	4.4	18	8.9	5	2.5	6	3.0
		Northumberland	0	0.0	8	2.5	26	8.2	5	1.6	5	1.6
		Total	5	0.6	70	8.6	96	11.8	18	2.2	43	5.3
	South of Tyne & Wear	Gateshead	1	0.5	24	11.9	64	31.7	3	1.5	9	4.5
		South Tyneside	2	1.3	13	8.7	34	22.8	4	2.7	1	0.7
		Sunderland	2	0.7	14	5.0	28	10.1	3	1.1	16	5.8
		Total	5	0.8	51	8.1	126	20.0	10	1.6	26	4.1
	Tees	Hartlepool	0	0.0	11	11.9	17	18.3	1	1.1	2	2.2
		Middlesbrough	0	0.0	31	22.1	40	28.5	0	0.0	19	13.5
		Redcar and Cleveland	0	0.0	7	5.2	7	5.2	2	1.5	3	2.2
		Stockton-on-Tees	0	0.0	26	13.3	11	5.6	0	0.0	7	3.6
		Total	0	0.0	75	13.3	75	13.3	3	0.5	31	5.5
	Total		13	0.5	215	8.2	372	14.1	35	1.3	110	4.2
	England & Wales	Total	1,333 ⁵	2.4	5,083 ⁵	9.2	6,428 ⁵	11.6	1,181 ⁵	2.1	5,083 ⁷	9.2

1 Data source: EpiNorth3, 2017 data. Diagnosis (confirmed, possible and probable)

2 Data source: NOIDS, 2017 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 2017 data for England only

4 SGSS, 2017 data. Includes cases confirmed by NHS laboratories only.

5 Data source: HPZone 2017 data for England only. Includes reported infections of hepatitis A, B, C and E.

6 Data source: Enhanced Tuberculosis Surveillance (ETS), 2017 data.

7 Data source: Enhanced Tuberculosis Surveillance (ETS), 2017 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 North East surveillance reports

	Output¹	Frequency	Email Recipients
Reports sent to external partners	SGSS Trust Feedback Report (SGSS Weekly Laboratory report)	Weekly	HPT, FET NE, LPHM, ATMs
	Influenza and influenza-like illness (ILI) Bulletin	Weekly	HPT, FET NE, LPHM, SIT, PHE Regional Office, CCGs, NHSE, ATMs, emergency planners, others
	Infectious Intestinal Disease (IID) Bulletin	Weekly	HPT, FET NE, LPHM, SIT, PHE Regional Office, CCGs, NHSE, ATMs, emergency planners, others
	Seasonal Respiratory Disease Report	Weekly	HPT, FET NE, LPHM, virologists, contributing ATMs
	HCAIs Monthly Summary	Monthly	HPT, FET NE, SIT, LPHM, ICNs, ATMs
	IPD Laboratory Audit Report	Monthly	FET NE, LPHM, ATMs
	Health Protection Surveillance Report (former DsPH Report) ²	Quarterly	HPT, FET NE, LPHM, SIT, DsPH, LA EHOs, ATMs
	Care Home outbreak report	Quarterly	HPT, FET NE, DsPH,
	Vaccine Preventable Diseases (VPD) Bulletin	Quarterly	HPT, FET NE, LPHM, SIT, DsPH, ATMs
	Anti-Microbial Resistance (AMR) Report	<i>Quarterly (under review)</i>	HPT, FET NE, LPHM, ATMs, ICNs
	Sexual Health Bulletin	Quarterly	HPT, FET NE, LPHM, SH Leads, DsPH, ATMs, GUM consultants, ID physicians
	Spotlight Report STI	Annual-September	HPT, FET NE, LPHM, SH Leads, DsPH, ATMs, GUM consultants
	Spotlight Report HIV	Annual-December	HPT, FET NE, SH Leads, DsPH, ATMs, GUM consultants, ID physicians
	LASER report (STI)	Annual-December	HPT, FET NE, DsPH
	Annual TB Report	Annual-November	HPT, FET NE, LPHM, TB leads, TB clinicians, ATMs
	Campylobacter Report	Annual-February	HPT, FET NE, LPHM, LA EHOs, ATMs
Salmonella Report	Annual-March	HPT, FET NE, LPHM, LA EHOs, ATMs	
Annual Hepatitis C Report	Annual-January	HPT, FET NE, LPHM, DsPH, ID physicians, virologists, ODN, Drug action teams	

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	<i>Output¹</i>	<i>Frequency</i>	<i>Email Recipients</i>
	Annual Hepatitis B Report	Annual-March	HPT, FET NE, DsPH, ID physicians, virologists, ODN, Drug action teams
	IPD Annual Report	Annual-March	HPT, FET NE, LPHM, ATMs, ID physicians, GP via CCG
<i>Reports for HPT/FET NE</i>	EpiNorth3 Exceedance Alert	Daily	HPT, FET NE
	EpiNorth3 Typing Coincidence Alert	Daily	HPT, FET NE
	EpiNorth3 Postcode Coincidence Alert	Daily	HPT, FET NE
	EpiNorth3 Exceedance Report	Weekly	HPT, FET NE
	EpiNorth3 Postcode sector Report	Weekly	HPT, FET NE
	E piNorth3 Exposures Exceedance Report	Weekly	HPT, FET NE
	EpiNorth3 Weekly Case Summary Report	Weekly	HPT, FET NE
	SGSS Quarantined Data Report	Weekly	HPT, FET NE
	COVER data charts	Quarterly	HPT, FET NE

1. EXCLUDES Internal communication reports, internal audit reports and forwarded national reports. All reports are disseminated via email (except for LASER reports that are available through SH portal)

2. Stakeholder reports contain data for the following organisms/diagnoses; Salmonella, E. coli O157, Campylobacter, Cryptosporidium, Giardia, Shigella, Meningococcal disease, measles, mumps, rubella, pertussis, Hepatitis A, B & C, Listeria, Legionella, TB, Scarlet fever, Invasive Group A Streptococcus(iGAS).

Abbreviation	Description	Abbreviation	Description
HPT	Health Protection Team (PHEC NE)	FET NE	Field Epidemiology Team North East
ATMs	Acute Trust Microbiologists	ICNs	Infection Control Nurses
SIT	Screening & Immunisation Team	LPHM	Lead Public Health Microbiologist
CCGs	Clinical Commissioning Groups	SH Leads	AT and CCG and clinical network Sexual Health Leads
LA EHOs	Local Authority Environmental Health Officers	NHSE	NHS England
DsPH	Directors of Public Health	ODN	Hepatitis C Operational Delivery Network
ID	Infectious Diseases		

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, Newcastle.

PHE Laboratory Service	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
- Wilson D, Dolan G, Aird H, Sorrell S, Dallman TJ, Jenkins C, Robertson L, Gorton R. **Farm-to-fork investigation of an outbreak of Shiga toxin-producing Escherichia coli O157**. *Microb Genom*. 2018. doi: 10.1099/mgen.0.000160
- Dolan G, Chauhan M, Foster K, Basta M, Bushby S, White C, Verlander NQ, Gorton R. **Factors associated with repeat diagnosis of syphilis in genitourinary medicine (GUM) clinic attendees in the North East of England, 2002-2014**. *Int J STD AIDS*. 2018. <https://doi.org/10.1177/0956462418757554>
- Henderson M, Howard SJ; **Screening for latent tuberculosis in UK health care workers**, *Occupational Medicine*, Volume 67, Issue 8, 2 December 2017, Pages 641–643, <https://doi.org/10.1093/occmed/kqx119>
- Howe B, Kirsty K, Waldram A, Hussey J. Challenges in the management of syphilis in pregnancy: completing a multicentre audit cycle with mixed outcomes. *International Journal of STD & AID*. 2018; 29(4):418-420
- Waldram A, Dolan G, Ashton PM, Jenkins C, Dallman TJ. Epidemiological analysis of Salmonella clusters identified by whole genome sequencing, England and Wales 2014. *Food Microbiol*. 2018;71:39-45.
- Kanagarajah S, Waldram A, Dolan G, Jenkins C, Ashton PM, Carrion Martin AI, Davies R, Frost A, Dallman TJ, De Pinna EM, Hawker JI, Grant KA, Elson R. Whole genome sequencing reveals an outbreak of Salmonella Enteritidis associated with reptile feeder mice in the United Kingdom, 2012-2015. *Food Microbiology*. 2018 May; 71:32-38. doi: 10.1016/j.fm.2017.04.005. Epub 2017 Apr.
- Waldram A, Vivancos R, Hartley C & Lamden K. Prevalence of Giardia infection in households of Giardia cases and risk factors for household transmission. *BMC Infect. Dis*. 2017; 17(1):486.
- Kwiatkowska RM, Manley P, Sims B, Lamagni T, Ready D, Coelho J, Alsaffar L, Beck CR, Neely F. Outbreak of group A Streptococcus emm94.0 affecting people who inject drugs in southwest England, April 2017. *Am J Infect Control*. 2018 Feb; 46(2):238-240.

Oral presentations on research to conferences

- Helen Bagnall, M. Henderson, R. Chalmers, G. Dolan: Use of gp60 subtyping in the investigation of cryptosporidiosis cases linked to two swimming pools, and the identification of a rare subtype of *Cryptosporidium hominis*, England, October 2016. ESCAIDE. November 2017

Poster presentations on research to conferences

- Hope Simpson, Jonathan Lawler, Sarah Morey, Russell Gorton, Manoj Valappi, Stuart McPherson. Mapping treated and untreated hepatitis C infections in the North East of England to facilitate the strategic development of hepatitis C services. British Association for the study of the liver. September 2017

- K Houseman, K Chapman, P Manley, R Gorton, D. Wilson, G.J. Hughes. Decreasing 30-day mortality following invasive pneumococcal disease, north east of england, 2006–2016. PHE Research and Science Conference. March 2018
- K Houseman, K Chapman, P Manley, R Gorton, D Wilson, GJ Hughes: Decreasing 30-day mortality following invasive pneumococcal disease, north east of england, 2006–2016. Five Nations Conference. March 2018
- Helen Bagnall, Petra Manley, Joan Henderson, Russell Gorton: Exposing exposures: automation of infectious disease exposure exceedance reporting in the North East of England. PHE Research and Science Conference. March 2018
- Helen Bagnall, Petra Manley, Joan Henderson, Russell Gorton. Exposing exposures: automation of infectious disease exposure exceedance reporting in the North East of England. Five Nations Conference. March 2018
- P Acheson, E Grunert, J Kinsella-Shenton, K Stoker, S Ziolkowski, H Bagnall. Campylobacter parfait – an old favourite with a novel twist. Five Nations Conference. March 2018

Audits

The local field epidemiology team undertake regular audit and quality checks for routine surveillance data including SGSS lab reporting, HPZone and EpiNorth 3 data and TB data reported to ETS.