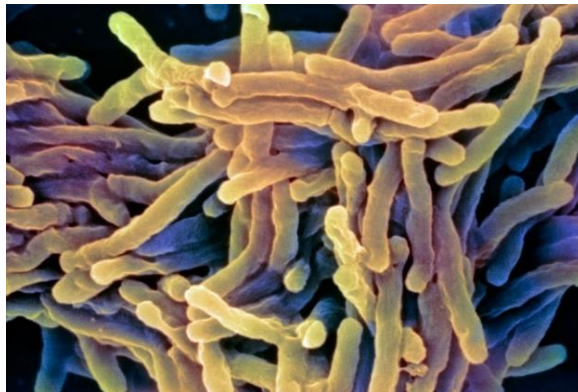




Public Health
England

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

Annual Report 2018/19



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.

Paul Davison
Deputy Director for Health Protection
Public Health England
North East Public Health England Centre
Floor 2, Citygate, Gallowgate
Newcastle upon Tyne, NE1 4WH
paul.davison@phe.gov.uk
Tel: 0300 303 8596 (Option 1)

© Crown copyright 2019

You may re-use this information (excluding logos) free of charge in any format or medium, under the terms of the Open Government Licence v3.0. To view this licence, visit [OGL](#). Where we have identified any third-party copyright information you will need to obtain permission from the copyright holders concerned.

Published June 2019
PHE publications

PHE supports the UN
Sustainable Development Goals



Contents

Foreword	4
1. Introduction and recent developments	6
2. Prevention – communicable disease	9
3. Surveillance – communicable disease	12
4. Control – specific diseases	14
5. Control - responding to communicable disease outbreaks and incidents	32
6. Healthcare in a prison setting	35
7. Emergency preparedness, resilience and response (EPRR)	37
8. Communications team	39
9. Environmental issues	40
10. Improving the quality of health protection services	42
Appendix 1: Notifications and other reports of infectious disease in North East 2018	43
Appendix 2: Schedule of routine PHE North East surveillance reports	46
Appendix 3: The PHE Public Health Laboratory Service in Newcastle upon Tyne and York	48
Appendix 4: Publications and presentations (HPT and FS)	49

Foreword

Welcome to the ninth annual report produced by the North East Health Protection Team (HPT). 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.

Over the course of the last year the HPT have continued to provide an effective health protection response to the people of the North East. We have continued the patch-based structure with a consultant and senior nurse/practitioner aligned to north of Tyne, south of Tyne, Durham and Darlington and Tees Valley. There is no intention to change this arrangement which has worked well for many years.

Perhaps one of the most significant changes that has occurred over the last year has been the increased public perception of the importance of environmental public health. There has been a renewed focus on air quality, particularly in relation to air pollution caused by traffic emissions and the requirement for several local authorities to produce plans to reduce nitrogen dioxide (NO₂) concentrations by introducing Clean Air Zones. It has also been a year when the reality of the threat to public health from climate change has been widely acknowledged and the urgent need for action more fully understood. Several local authorities in the North East, along with other institutions, have declared a 'climate emergency' and work is going on across the North East to ensure that health and care organisations are taking their responsibilities seriously to meet carbon reduction targets.

The merger of NHS England and NHS Improvement is also significant. PHE has introduced a new post of Regional Director of Public Health to work alongside the new NHS management arrangements in the seven regions. At the time of writing this report work is taking place to agree the precise working arrangements for these posts. However, it is hoped that having public health input at such a senior level will strengthen public health interventions by the NHS.

Finally, like all public sector organisations PHE is facing a reduction in its budget. For 2019/20 we have tried to protect front-line services as much as possible and we will continue to do so.

We hope that this report is informative and helpful. If you have any comments on the content or format, please let us know.

Paul Davison
Deputy Director Health Protection
paul.davison@phe.gov.uk

June 2019

Summary of progress on 2018/19 priorities

The HPT identified eight 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 2018/19.	Achieved
2	Continue to consolidate the North East TB Network	Achieved
3	Deliver the 2018/19 objectives as outlined in the NE TB strategy.	Partially achieved
4	Deliver HP/STAC update session for DsPH and public health teams	Achieved
5	Provide targeted support local authorities in meeting NO ₂ reduction targets and associated activities in improving air quality.	Achieved
6	Finalise the review of EpiNorth3 (local health protection surveillance system)	Achieved
7	Complete outputs from the Invasive Pneumococcal Disease project	Achieved
8	Produce a health protection annual report for 2018/19	Ongoing

Priorities for 2019/20

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 2019/20 have been revised to include action on improving air quality. Our objectives continue to be revised to take this into account.

Table F2: Local priorities for 2019/20

	Priorities
1	Continue to deliver a safe and effective health protection service to the people of the North East in 2019/20.
2	Review the TB Network action plan to ensure a continued focus on reducing TB rates in the North East through early identification, increased treatment completion and reducing secondary transmission.
3	Chair the national task and finish group on supporting TB control in low incidence areas.
4	Deliver HP/STAC update session for DsPH and public health teams
5	Promote awareness of and action on climate change as a major public health threat and advocate for the implementation of mitigation and adaptation interventions.
6	Support NHS Trust microbiologists across the North East to review existing CPE screening and management protocols and to consider harmonisation across Trusts
7	Conclude the IPD project and complete the necessary outputs.
8	Produce a health protection annual report for 2019/20.

1. Introduction and recent developments

1.1. This report

This is the ninth Annual Report compiled by the North East Health Protection Team. It outlines the key health protection issues in 2018/19 and identifies the strategic priorities for 2019/20. 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 public health protection is a collaborative activity involving a range of organisations and departments 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 and NHS Improvement, 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 environmental 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 Service continue to collate information on communicable diseases from a wide range 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 commissions 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 Service

The North East Field Service (FS) team is one of seven similar teams across the country. These teams are nationally managed and co-ordinated but geographically dispersed. Their

purpose is to provide specialist epidemiological and public health microbiological expertise to support Health Protection teams in field epidemiological investigations and surveillance.

In addition, the local Field Service 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 Service (FS) team works closely with the HPT; jointly managing North East based surveillance systems and providing epidemiological components of incident investigations, and analytic studies.

In 2019, the FS teams from the North East and Yorkshire and the Humber merged under a single management structure. This decision was taken in order to ensure that Field Services were able to meet their reduced financial targets for 2019/20, but also to provide increased resilience across both areas.

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

Since last year's report there has been a change in the process for delivering local public health microbiology services. These are now commissioned rather than directly provided by PHE. Following a tendering process Newcastle upon Tyne Hospitals NHS Foundation Trust was successful in winning the tender to provide the service and this commenced formally in November 2018. The HPT is part of the contract monitoring group. Food, Water and Environmental laboratory services continue to be delivered from the York Laboratory.

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 10.2.

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. Whole genomic sequencing (WGS)

WGS continues to be an integral part of public health investigation and practice. As of 2019, PHE routinely sequences human isolates of *Salmonella*, *E. coli*, *Shigella*, *Listeria*, *Mycobacterium tuberculosis* and *S. aureus* 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*.

WGS of gastrointestinal organisms is 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 Service team, has developed reports that highlight clusters of genetically similar organisms. The national Gastrointestinal Team also produces a national overview of five SNP clusters which the local Field Service team also monitors for activity. In general, clusters of two or more cases within five SNPs are assessed using exposures previously collected to gauge if a common source is present or if further investigation may be required.

The WGS of TB has recently been rolled out to all of England although we have had this capability for since 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. The HPT and the FS team are working together with other stakeholders to introduce an automated report summarising individual TB clusters.

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 rapidly 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 14 different vaccine-preventable infections. In addition to the routine childhood programme, selective vaccination is offered to individuals reaching a certain age or with underlying medical conditions or lifestyle risk factors.

Programme delivery

NHS England is responsible for commissioning local immunisation programmes and accountable for ensuring local providers of services 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 and Improvement 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.

Figure 2.1. shows a timeline of vaccine development and introduction of the routine vaccine programme. Following recommendation 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 2018/19:

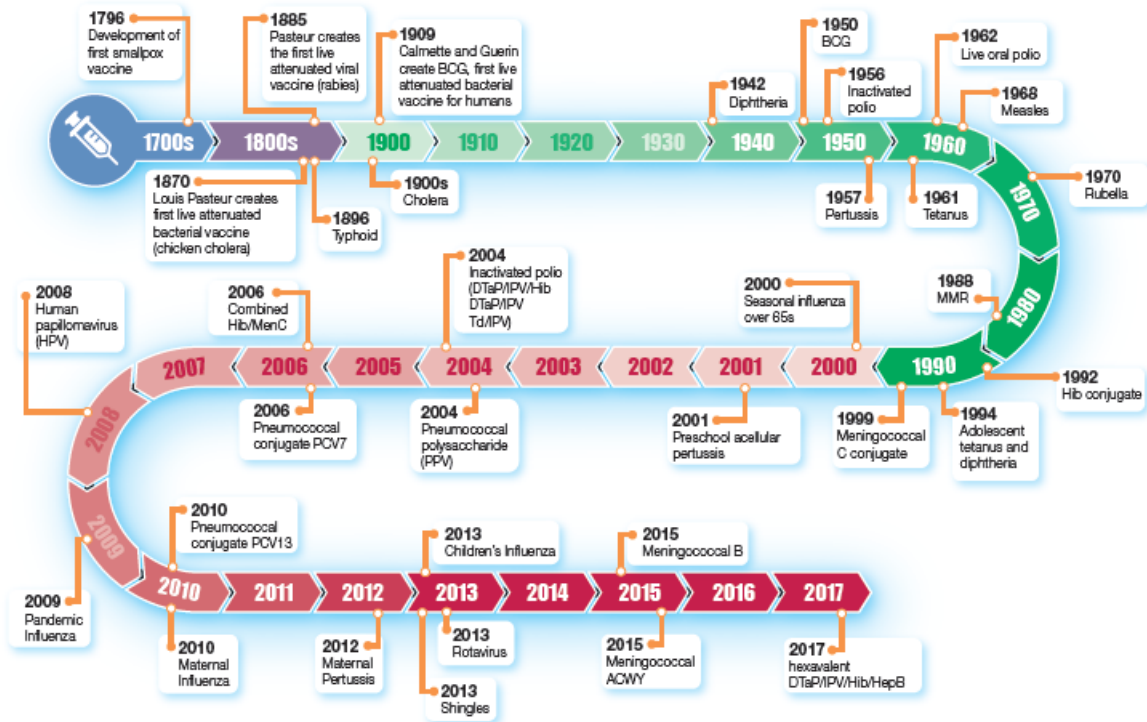
Meningococcal ACWY (MenACWY) The adult 18-25-year programme was removed on 1 April 2018.

Meningococcal ACWY (MenACWY) completing dose - the cohort has been extended to include additional school leavers not previously covered by the previous programme.

Shingles routine patients are eligible from the day they turn 70 years, they do not have to be 70 on the 1 September of the relevant year.

Shingles catch up patients aged 78 years on 1 September 2016. Patients previously eligible remain eligible for vaccination until their 80th birthday. The shingles vaccine is now offered all year round to eligible patients.

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



Public Health England 2018

Coverage rates

Uptake in the North East for the routine childhood programme remains among the highest in England: In Quarter 3, 2018: (Oct-Dec 18)

- By aged 12 months, 95.5% of children in the North East (92.1% in England, 93.2 England excluding London) 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. *Note this is not on the schedule now.*
- By 24 months, 93.7% (90% in England, 91.8 England excluding London) had received measles, mumps and rubella (MMR) vaccine (dose 1).
- By 5 years, 92.1% (86.5% in England, 89 England excluding London) had received two doses of MMR.
- By 5 years, 90.4% (85.3% in England, 87.9 England excluding London) had received diphtheria, tetanus, polio booster. (DTaP/IPV Booster)

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 and NHS Improvement 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 (HCAIs).
- Local authorities providing results of investigations into diseases which may be foodborne and intelligence about cases and outbreaks, usually of suspected food poisoning.
- Prison healthcare staff reporting certain suspected diseases and possible outbreaks.
- Care homes reporting illness in residents or staff, usually cases of diarrhoea and/or vomiting, but also respiratory disease outbreaks or other infections.
- Reports from other settings such as schools and nurseries with concerns about possible outbreaks of flu-like illness, diarrhoea and/or vomiting, or illnesses with a rash.
- Results of investigations by the NE HPT.
- Other ad-hoc contacts.

Case reports from notifications, laboratory reports and information from other sources are risk assessed by HPT staff and public health action taken as required. 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 2018 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 methicillin-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 Service 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 informs microbiologists in NHS Trusts about new and emerging resistance problems and how far they have spread. Surveillance of Carbapenemase Producing Enterbacteriaceae (CPE) is also in place.

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 produces 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. Detailed information on a range of sexual health indicators can also be reviewed on the PHE Fingertips tool:

<https://fingertips.phe.org.uk/profile/sexualhealth>

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. New developments in the GUMCAD surveillance system are being introduced in the coming year which will give more detailed information on risk factors and partner notification activities.

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 June 2019.

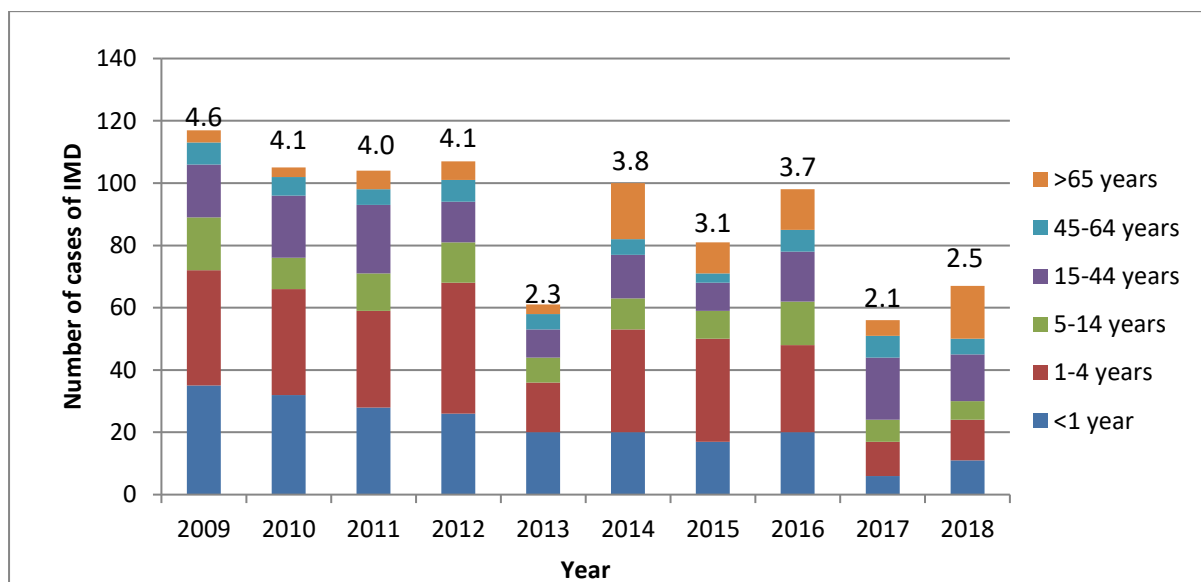
4. Control – specific diseases

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 2009 to 2018.



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 2018

Local Authority	Number of cases	Rate (per 100,000)
County Durham	7	1.3
Darlington	3	2.8
Gateshead	12	5.9
Hartlepool	4	4.3
Middlesbrough	4	2.8
Newcastle upon Tyne	9	3.0
North Tyneside	3	1.5
Northumberland	3	0.9
Redcar and Cleveland	11	8.1
South Tyneside	3	2.0
Stockton-on-Tees	2	1.0
Sunderland	6	2.2
North East Total	67	2.5

*Rate uses local authority population figures for 2017

Serogroup group B still accounts for most cases in the North East, this is in line with the national picture. In 2017 there was a significant reduction in Men B cases being reported compared to previous years and this lower rate has also been observed in 2018. In 2017 there was a reduction in Men W135 cases by 70% compared to 2016. In 2018 there was an increase in the number of cases reported from 7 to 12. In 2018 there was a 40% reduction in Men C cases being reported compared to 2017.

Table 4.2: Laboratory confirmed cases of meningococcal disease by serotype for 2009 to 2018

Serogroup	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
B	68	53	62	48	31	33	38	39	21	21
W135	1	1	3	3	4	12	13	23	7	12
Y	1	3	0	4	3	4	4	5	2	2
C	0	0	0	3	1	2	1	5	5	3
Z	0	0	0	0	0	0	0	0	0	0
*Probable	45	46	34	48	22	48	25	24	21	29
North East Total	115	103	99	106	61	99	81	96	56	67

*Probable cases - No laboratory confirmation, treated on clinical diagnosis.

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 in young adults aged 15 to 19 years old.

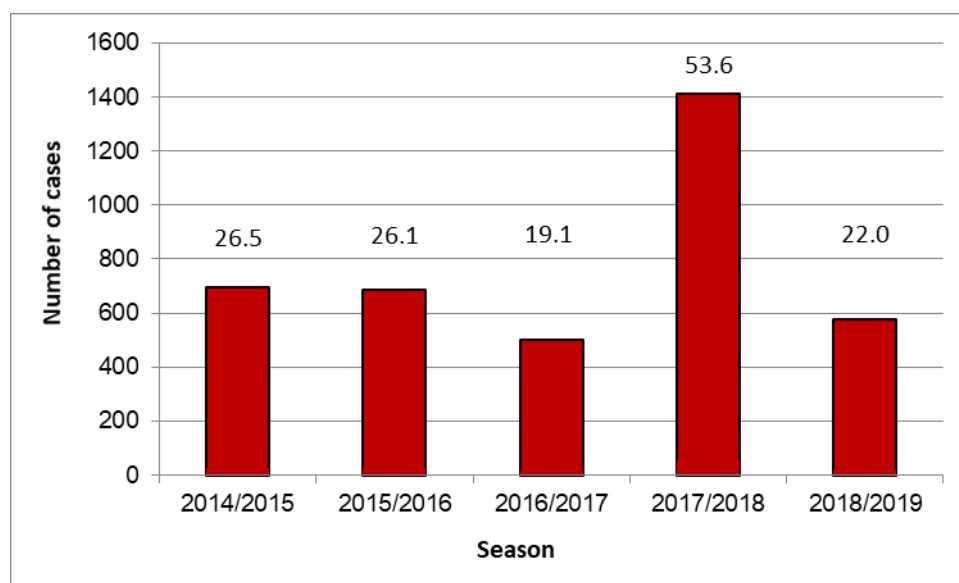
4.2. Invasive Group A streptococcal disease (iGAS) and scarlet fever

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.

Following an increase in notifications in 2014/15 (26.5 per 100,000 vs. 18.2 per 100,000 in 2013/14), the rate to date has remained high. In the 2017/18 season there was a 182% increase in notifications of scarlet fever (1413 cases; 53.6 per 100,000). This was the highest number of notifications over the past five seasons. However, in 2018/19 the rate decreased to 22.0 per 100,000 (579 cases), which was comparable to the rates observed in the 2016/17 and 2015/16 seasons.

Figure 4.2: Number* of cases of scarlet fever in the North East and overall rate by season‡, from 2014/2015 to 2018/2019



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

‡ The numbers above the bars show the overall rate of notifications of scarlet fever per 100,000 in the North East.

Quarterly notifications of scarlet fever were comparable in 2014, 2015 and 2016, with the highest number of cases reported in Q1 and Q2, as expected given the seasonal nature of the infection. However, in 2017, notifications in Q4 were higher than in Q1 and Q2. Increased notifications were observed in both Q1 and Q2 2018, with 908 notifications in Q1 and 704 in Q2; a 193% and 272% increase from Q1 and Q2 2017 respectively. Notifications from Q3 2018 onwards were in line with 2014-2016 figures.

Table 4.3: Scarlet fever notifications to NE PHE Centre by quarter, 2014-2019

Year	Quarter				Total
	1	2	3	4	
2014	330	498	112	203	1,143
2015	466	243	85	162	956
2016	491	367	127	146	1,131
2017	309	189	128	341	967
2018	908	704	136	212	1,960
2019	305				

Data from EpiNorth3. Cases by referral date.

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.

In 2013, the incidence of iGAS rose significantly in the North East and nationally and has remained elevated since. As with scarlet fever notifications, there was a substantial increase in cases in Q1 2018, with 78 notifications compared with 28 in 2017. Overall, 189 cases were notified in 2018, a 52% increase in notifications from 2017 (124 cases). Notifications from Q1 2019 were lower than Q1 2018 (43 vs. 78 cases).

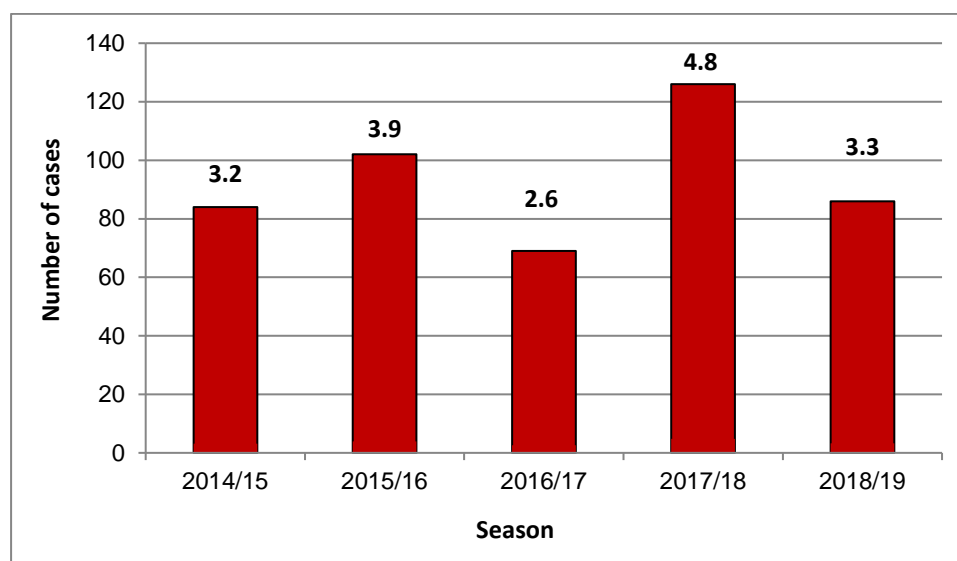
Table 4.4: Invasive Group A streptococcal disease reported to NE PHE Centre by quarter, 2014-2019

Year	Quarter				Total
	1	2	3	4	
2014	30	32	25	21	108
2015	51	54	30	33	168
2016	63	45	25	28	161
2017	29	30	30	35	124
2018	78	54	24	33	189
2019	43				

Data from HPZone. Cases by referral date.

iGAS infections tend to have a seasonal pattern with the highest incidence from December to April. In 2017/2018 the rate of iGAS infections rose substantially in the North East from 2.6 per 100,000 in 2016/17 to 4.8 per 100,000. In 2018/19 this rate had decreased to 3.3 per 100,000, which was comparable to the rate observed in the 2014/15 and 2015/16 seasons.

Figure 4.3: Number of cases of invasive Group A Streptococcus (iGAS) in the North East and overall rate[‡] by season*, from 2014/2015 to 2018/2019



* 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

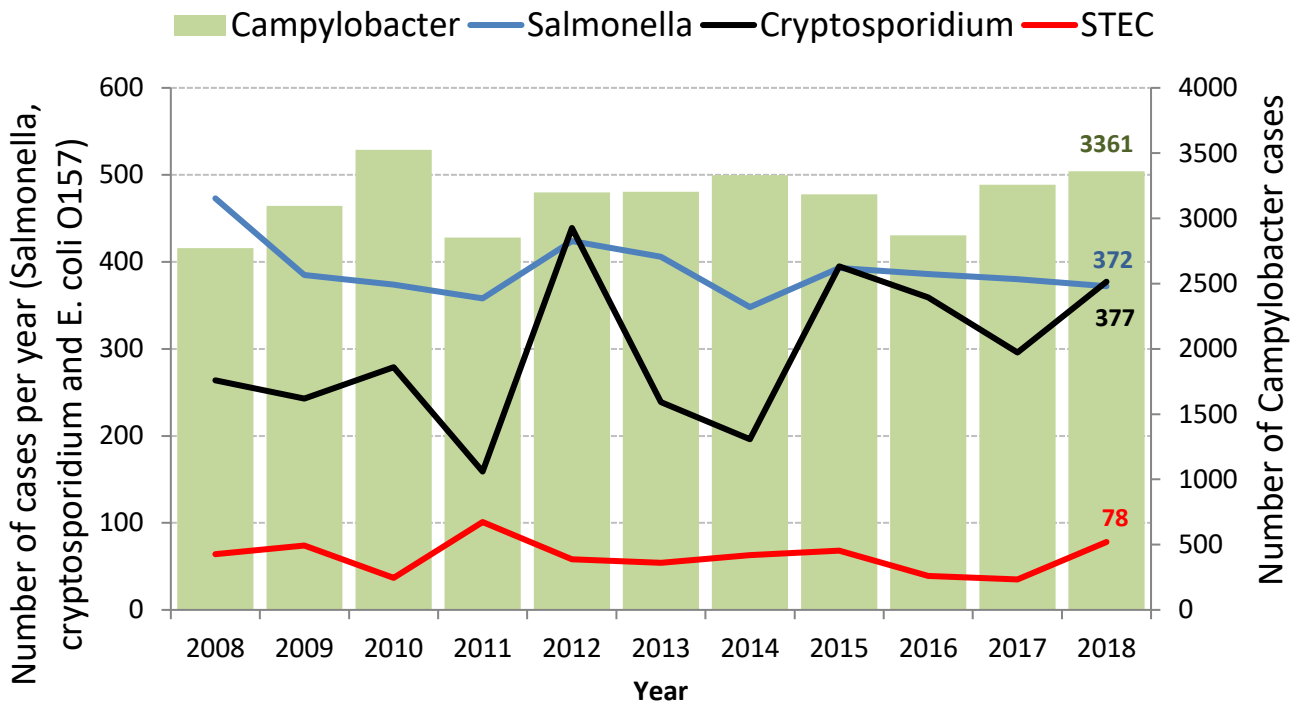
A number of organisms can cause gastrointestinal infection of which campylobacter and salmonella are the bacteria most commonly identified by laboratories. Many viral gastrointestinal infections occur but most are not laboratory confirmed as symptoms are usually short-lived. The majority of the NE HPT’s work on gastrointestinal infections relates to individual sporadic cases of infection. Gastrointestinal infections are spread by the faeco-oral route which can include via food, water, sexual contact or from contact with an infected person or animal or contact with a contaminated environment. Food poisoning outbreaks are described in Section 5.

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 with 78 cases in 2018, but recent changes to laboratory testing methods has increased the number of cases reported. The prevention and control 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 2018 there were several family clusters associated with animal contact which shows how easily the infection can be transmitted in households and other settings.

Campylobacter infection is by far the most common bacterial cause of gastrointestinal infection reported regionally causing more than 80% of all cases. Reducing the numbers of campylobacter cases requires national and local actions at all stages of meat (particularly chicken) production and processing from the farm all the way to, and within, the home. The number of campylobacter cases in 2018 increased to 3,361.

Salmonella is the second most common bacterial cause of gastrointestinal infection. In the North East all cases of salmonella are investigated by the HPT and the local authority EHOs. The trend in number of cases has been 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 2008 to 2018



Cryptosporidium infection is the most common protozoal gastrointestinal infection reported. Infection is often acquired from contact with contaminated animals, 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 2018 there were no significant outbreaks of cryptosporidiosis in the North East.

Other gastrointestinal infections. Other less common causes of gastroenteritis and food poisoning such as shigella, *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.

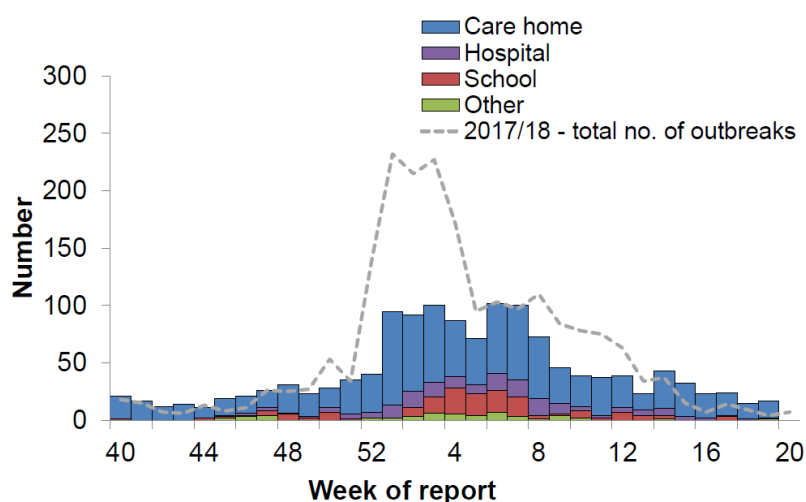
4.4. Influenza

This section should be read alongside the joint NHS England and NHS Improvement and PHE seasonal influenza vaccination report 2018/19.

Seasonal influenza

During the 2018-19 season, influenza A(H1N1)pdm09 and A(H3N2) co-circulated, with A(H1N1)pdm09 dominated for much of the season. The number of outbreaks of acute respiratory illness reported in closed settings in the UK (1,340) was lower than during the 2017/18 season (2,149) [figure 1], the majority (70%) being reported by care homes.³ The number of outbreaks reported in care homes was, however, higher than the number reported in 2015/16, the last A(H1N1)pdm09 dominated season. In the North East a total of 40 outbreaks of influenza like illness (ILI) were reported (80% from care homes) compared with 49 in the 2017/18 season.

Figure 4.5: Weekly number of acute respiratory outbreaks by institution, UK¹



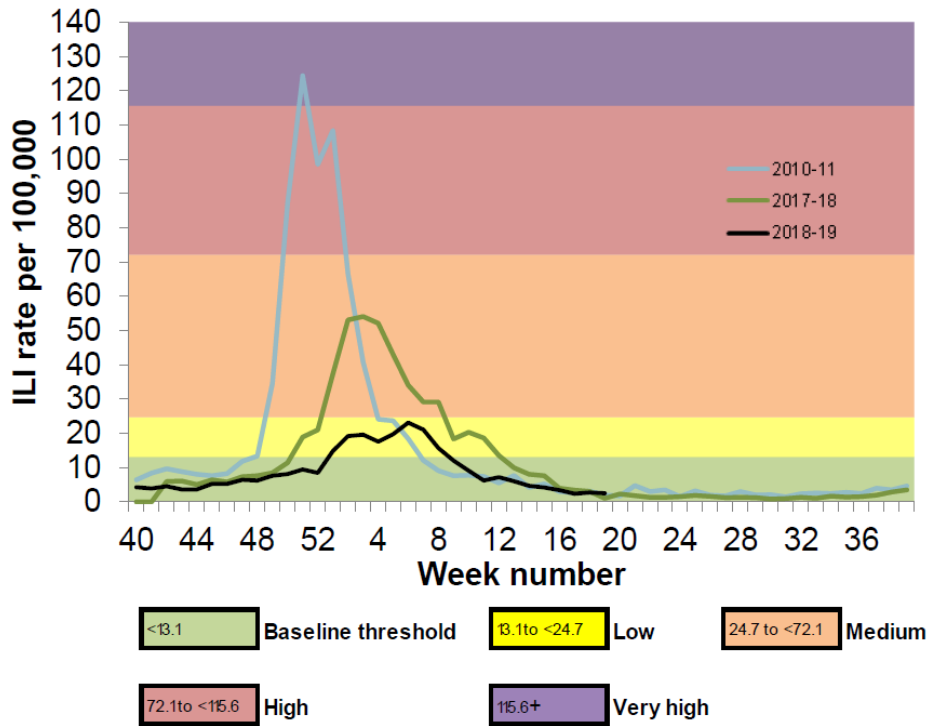
Rates of influenza-like illness (ILI) were observed at low intensity levels in the community. Weekly GP consultations for ILI in England exceeded the baseline threshold for an 8-week period (weeks 1-8 2019), with activity peaking at 23.1 per 100,000 in week 6 2019. This was lower and later than the peak in the 2017-18 season (54.1 per 100,000, week 03 2018) [figure 2]¹ and similar to the peak activity observed in 2015/16 (28.7 per 100,000), the last A(H1N1)pdm09 dominated season.

In keeping with previous A(H1N1)pdm09 dominant seasons, a moderate to high impact was observed in secondary care. The weekly rate of hospitalised cases remained above the baseline between week 51 2018 and week 15 2019, activity peaking in week 6 2019 (6.87 per 100,000 trust catchment population).¹ This was lower than the peak activity observed in 2017/18 (9.20 per 100,000 trust catchment population), but higher than the peak activity observed during the last A(H1N1)pdm09 dominated season (3.4 per 100,000). A total of 2,924 influenza confirmed admissions to ICU/HDU were reported in England from week 40 2018 to week 15 2019, the majority of which were influenza A (2,898; 99%).¹ Where subtyped, 834 (29%) were influenza A(H1N1)pdm09 and 204 (7.0%) influenza A(H3N2).¹ The number of admissions to ICU/HDU in England was slightly lower when compared to the 2017/18 season

³ PHE. Surveillance of influenza and other respiratory viruses in the UK. Winter 2018 to 2019. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/805563/Surveillance_of_influenza_and_othe_r_respiratory_viruses_in_the_UK_2018.pdf

(3245) and higher than the number observed in 2015/16 (2190) which was the last A(H1N1)pdm09 dominated season. In common with previous A(H1N1)pdm09 dominant seasons young adults were primarily affected with the number of ICU/HDU admission being greatest in the 45-64-year age group. The rate of influenza admissions to ICU/HDU was highest in 45-64-year olds for influenza A(H1N1)pdm09 and in 75+ year olds for A(H3N2).¹

Figure 4.6: Weekly all age GP influenza-like illness consultations rates for 2018-19, England (RCGP).



A total of 273 influenza deaths in ICU were reported in England from week 40 2018 to week 15 2019.¹ No statistically significant excess mortality was observed during the 2018/19 season in England and levels of all-cause mortality were the lowest seen since 2013-2014.¹

Since week 40 2018, the PHE Respiratory Virus Unit characterised 959 influenza A(H1N1)pdm09 viruses, 237 A(H3N2) viruses and 3 influenza B viruses. ¹ Antigenic and genetic characterisation of viruses suggested that there was a close match between circulating and vaccine A(H1N1)pdm09 and A(H3N2) strains.¹

Pandemic influenza

A pandemic of influenza infection may occur when a new flu virus circulates in a population without any existing immunity. No specific pandemic influenza preparedness activities have been held in the North East since September 2017.

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.

Since June 2017, there have been no detections of avian influenza in poultry or kept birds in the UK. Between January and June 2018, the H5N6 strain of avian influenza was confirmed in 21 wild birds, none in the North East of England.⁴

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. 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. One imported human case of MERS-CoV infection was detected in the UK in August 2018. Two possible cases of MERS-CoV were reported to the North East HPT in 2018/19 both of whom tested negative.

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

The most common sexually transmitted infections in the North East continue to be chlamydia, genital warts, herpes, gonorrhoea and syphilis. Certain groups of the population are affected by poor sexual health more than others; infections in young people account for almost 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; it is important that these inequalities are monitored, and the findings used to inform how both prevention and treatment services are delivered.

The main health protection aspects of PHE's role regarding sexual health and HIV are surveillance of infections (see section 3.3), strategic work with partners to tackle the rising levels and inequalities in STIs & HIV and coordinating the investigation and control of clusters and outbreaks of infections.

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 2018, the most recent published STI and HIV figures (<https://www.gov.uk/government/statistics/sexually-transmitted-infections-stis-annual-data-tables> and <http://fingertips.phe.org.uk/profile/sexualhealth>).

During 2018/19 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.

⁴ PHE. Avian influenza (bird flu). Available at: <https://www.gov.uk/guidance/avian-influenza-bird-flu>

Overall numbers of STIs in the North East in 2016

There were 17,115 new diagnoses of STIs in the North East in 2018, a decrease (-7%) from 2017. The overall rate is 647/100,000 population (lower than the England rate of 805/100,000). Within the region, rates at local authority level range from 481 to 946 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 (644 and 648 per 100,000 residents respectively). More detail on these data will be published in the Spotlight on STIs report later in 2019.

Chlamydia

Chlamydia remains the most common STI in the region. The number of chlamydia cases diagnosed in North East residents decreased by 11% in 2018 (8,825 cases) compared to 2017 figures (9,946), the rate of infection (333 per 100,000 population) is lower than the overall England rate (392/100,000).

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 fell in 2018 compared to the previous year in the North East with a 3% decrease from 1,815 cases in 2017 to 1,751 cases in 2018; although cases have decreased in the last year it is important to recognise that there has been a 39% increase since 2013. Over half of the cases (1,029 cases) were in men and within this group over 500 were in men who have sex with men (MSM).

The concerns about antibiotic resistance in gonorrhoea continue; in the last year, two cases of extensively drug resistant (XDR) gonorrhoea were diagnosed in England. Both were associated with sexual contact abroad and there were no onward transmissions in the UK, however this again highlights how important the effective diagnosis, including specimens taken for culture, correct treatment and test of cure are in the control of this organism.

Syphilis

The number of syphilis cases in the North East rose by 21% in 2018, from 206 cases in 2017 to 249 cases in 2018. 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 (173 / 218 new cases in men), a greater number of cases are also being seen in heterosexuals.

A national action plan <https://www.gov.uk/government/publications/syphilis-public-health-england-action-plan>, bringing together the key actions needed to tackle the continuing rise in cases across England was published in June 2019. These recommendations will be reviewed by sexual health networks (public health and clinical) and a North East action plan drawn up.

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 and the importance of surveillance. Close collaborative working between public health and clinical teams are critical in promptly identifying changes in the patterns of infection in the community and coordinating actions required.

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.

Understanding the pressures on services and the changing ways in which they are delivered, the changing demographics of population accessing services and new behavioural factors that affect people's sexual health are all crucial in the work to protect and improve the public's sexual health.

HIV

The North East has a relatively low number of cases of HIV infection. In 2017 (the latest data available) 104 people were newly diagnosed with HIV; this was a marked fall in numbers of new diagnoses compared to recent years (26% lower than 2016) and represented 3% of new diagnoses in England. In 2017, there were 1,808 people living with HIV in the North East.

There have been large falls in numbers of new diagnoses across the country, particularly in London where targeted actions were put in place to increase the frequency of testing in higher risk groups. It is too early to say whether this fall in new diagnoses represents a similar pattern but is encouraging news which will be closely monitored.

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 2018/19 include:

- 40% of newly diagnosed cases of HIV in between 2015 - 2017 were diagnosed 'late' or 'very' late', which has a significant impact on long-term health outcomes. Heterosexuals were more likely to be diagnosed late (52% of males, 43% of females) than MSM (35%). By ethnic group black Africans were less likely to be diagnosed late than the white population (35% and 42% respectively).
- Late diagnosis remains an important challenge for the region, as well as for England 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.

- 44% of those living with diagnosed HIV in the North East were aged between 35 and 49 years, and 38% were aged 50 years and over (up from 21% in 2008).
- 14%* 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 (* where specimen tested for avidity)
- 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 (particularly 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. A safe and effective vaccine is available that can provide pre and post-exposure protection against hepatitis B infection. The vaccine has also been routinely available as part of the NHS vaccination schedule since 2017 and is offered to all babies at 8, 12 and 16 weeks of age.

The North East Health HPT provides direct public health advice in relation to cases of acute hepatitis B and their contacts. In 2018, a total of 16 cases of acute infection were reported in

the North East (see table below) compared to 14 cases in 2017, 15 cases in 2016, 7 cases in 2015 and 15 cases in 2014.

There was an increase in the number of young adults diagnosed with acute hepatitis B with a median age of 27.5 years observed in 2018 compared to 44.5 years in 2017. Heterosexual sexual transmission was the most likely source of infection for most cases and it was identified that a number of cases were local university students. The HPT worked with partners including the local authority public health team and GUM services to raise awareness in the local student population.

During 2018, 183 new diagnoses of chronic hepatitis B infection were reported across the North East. Written public health advice is given for chronic cases and their contacts via the treating clinician.

Table 4.5: Acute Hepatitis B cases reported to the North East Health Protection Team in 2018

	Male	Female	Total
Number (%)	9 (56%)	7 (44%)	16
Median age (range)	24 (19-56)	35 (18-67)	27.5 (18-67)
Ethnicity			
- White British	4	4	8
- Mixed – White and Black Caribbean	0	1	1
- Not known	5	2	7
Most likely place of transmission			
- UK	6	7	13
- Outside UK	1	0	1
- Not known	2	0	2
Most likely Source			
- Heterosexual sex	6	4	10
- Sex between men	0	0	0
- Unknown/other	3	3	6

Hepatitis C (HCV) infection

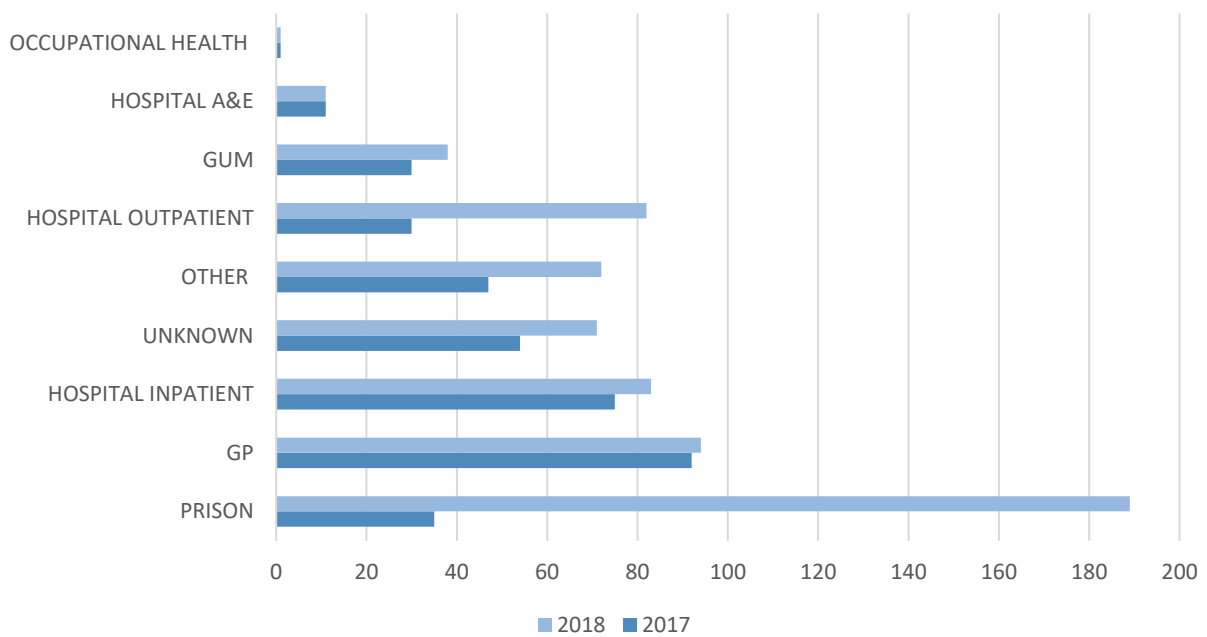
Most recent estimates suggest that there are around 113,000 people in England living with hepatitis C virus (HCV) infection. HCV is transmitted mainly through exposure to blood, blood-contaminated equipment or much more rarely by sexual intercourse or from mother-to-baby. Injecting drug use remains the most important risk factor for HCV infection, being cited as the risk in around 90% of all laboratory reported infections where risk factors have been disclosed. 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 available to prevent HCV.

In May 2016, the UK signed up to the WHO Global Health Sector Strategy (GHSS) on Viral Hepatitis which commits participating countries to the elimination of HCV as a major public health threat by 2030. There have been major developments in HCV 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. HCV treatment in England is delivered through NHS Operational Delivery Networks (ODNs) which were established in 2015.

In 2018, 641 newly detected hepatitis C cases were reported to the North East HPT, giving a rate of 24.2 per 100,000 population. This was considerably higher than the regional rate

reported in 2017 (11.8 per 100,000). However, it is important to note that changes in the number of laboratory reports of HCV may be reflective of changes in testing uptake and laboratory reporting, rather than variation in disease incidence. The inclusion of dried blood spot test results from North East prisons following the rollout of the bloodborne virus (BBV) opt-out bloodborne testing programme, has likely contributed to the increase observed in 2018, (Figure 4.7).

Figure 4.7: Hepatitis C cases reported to the North East Health Protection Team in 2017 and 2018 by referral source



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. PHE North East also continues to actively support the North East and Cumbria Hepatitis C ODN to ensure effective delivery of treatment in the region.

4.7. Tuberculosis

There were 122 cases of TB reported to the Enhanced Tuberculosis Surveillance System (ETS) in North East residents for the calendar year of 2018 (provisional data), which is slightly higher than the finalised figure for the calendar year of 2017 (110). The increase could be partly explained by an increase in reporting. 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.

Based on the finalised 2017 data, the North East remains one of the lowest incidence regions in England, with 4.2 cases per 100,000 population (compared with an incidence in England of 9.2 cases per 100,000 population). However, this figure masks considerable in-region variation: for example, Newcastle has 10.8 cases per 100,000 population, Middlesbrough 13.5 per 100,000 while County Durham has 1.6 and South Tyneside 0.7 per 100,000 population, (See Appendix 1). 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 four 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 focus on early detection, improving treatment completion and continue to minimise secondary transmission.

The cohort of TB patients in the North East has its specific challenges, 16% have at least one social risk factors with homelessness the most prevalent followed by drug use. 1% have HIV co-infection, a reduction from 3.5% in 2016. 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. 80% of drug-sensitive pulmonary TB cases complete their treatment within 12 months (provisional 2017 data). 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 (44%) 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 (60% 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 continue to work with primary care colleagues to raise awareness of the possibility of TB in UK-born residents.

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. Work is underway to consider how we retain a focus on TB treatment and control when the TB strategy ends in 2020.

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)

In last year's Annual Report, we reported that 2018/19 would be the final year of enhanced surveillance on IPD which commenced in 2006 when the 7-valent PCV (PCV7) was introduced into the UK childhood immunisation programme. Data collection ceased in 2018 and the research project will finish at the end of June 2019 with a final report summarising the key findings and outputs from this research. This section contains a summary of the initial findings.

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.

In 2006/07 the incidence of IPD across the North East population was estimated to be 12.0 per 100,000 population (307 cases). The incidence fell year on year, reaching its lowest point in 2013/14 (6.5 per 100,000 population; 170 cases), due to significant declines in the number of cases caused by serotypes contained in PCVs. This pattern was observed in all age groups due to the direct and indirect protection (herd immunity) provided by PCVs. However, the decline in PCV serotypes coincided with the emergence of non-PCV serotypes resulting in an increase in incidence for the first time in 2014/15 (8.8 per 100,000), suggesting that the maximum benefit of the PCV7/PCV13 programme may have been achieved. By 2017/18 the incidence had risen to 12.8 per 100,000 population. The increase in cases was most pronounced in older adults but was also seen in other age groups.

When looking at specific serotypes, three serotypes (serotype 3 contained in PCV13; serotypes 8 and 12F contained in PPV23) have emerged as the predominant serotypes circulating in the North East population. Together these serotypes accounted for 51% of all cases and 43% of cases ≥ 65 years in 2017/18.

There has been a small but significant decline in the 30-day case fatality rate following infection. The proportion of individuals (under 65) in clinical risk groups who developed IPD and were reported to have previously been immunised remains low (34%) in 2017/18. Together these findings highlight the need for continued surveillance of the distribution of pneumococcal serotypes; regular evaluation of national immunisation schedules; and further efforts to increase immunisation coverage in order to tackle the persistent burden of IPD.

Figure 4.8. Stacked incidence of IPD in the North East by vaccine-type and sero-type.

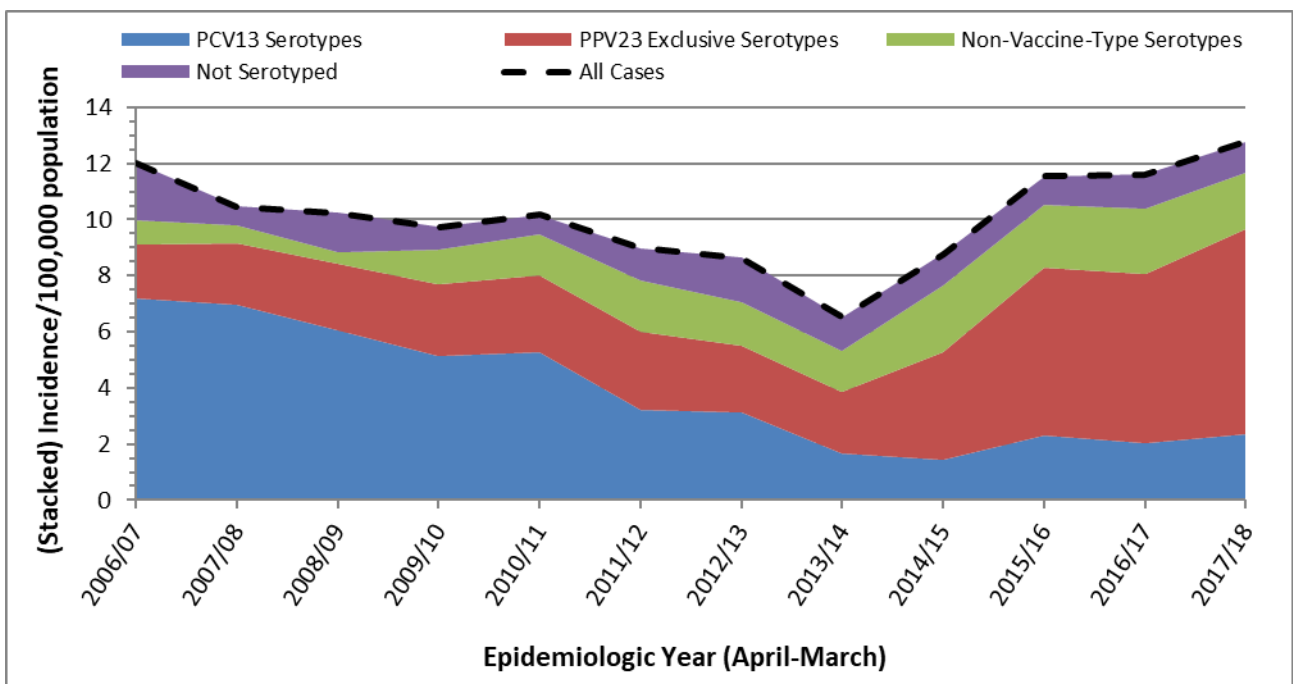
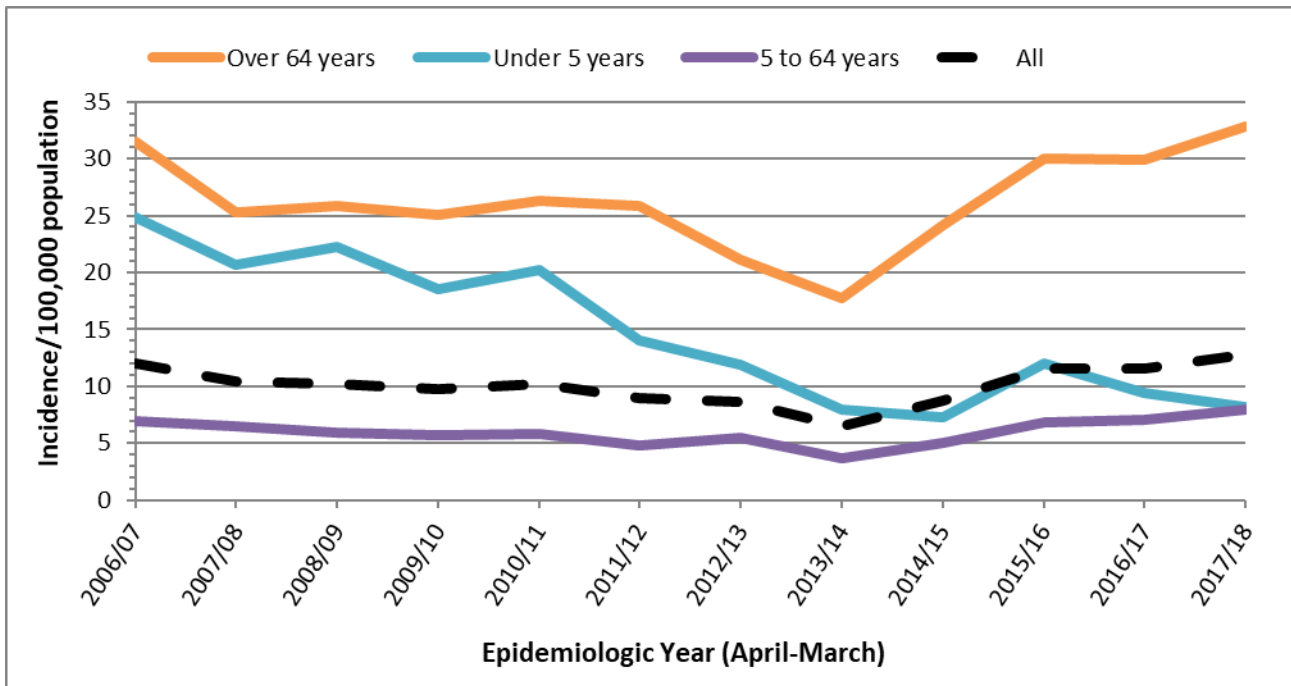


Figure 4.9 Incidence of IPD in the North East by age group.



4.9. Healthcare associated infection (HCAI)

Prevention and control of healthcare associated infections (HCAIs) is the primary responsibility of provider organisations. PHE supports organisations in this work in a number of ways. The local FS 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 (including 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 each year with financial and other penalties should these targets fail to be reached.

The 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 2018/19 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

In January 2019, a new cross-government [five-year action plan for AMR](#) was launched, along with a [twenty-year vision](#). These plans underline that antimicrobial resistance is a growing threat to public health, and that 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 retains 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.

Most hospital Trust laboratories in the North East electronically report the results of antibiotic sensitivity tests from microbiological specimens to PHE. 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. There is a Government ambition to reduce the number of healthcare associated GNBSIs by 50% from a 2016 baseline by 2020/21. Quality Premiums have been introduced to incentivise CCGs to oversee work across the whole health economy to achieve this reduction. In the North East, this has included work to improve resident hydration in care homes in order to reduce the incidence of gram-negative urinary tract infections which can develop into gram negative blood stream infections.

Carbapenemase-producing enterobacteriaceae (CPE) are a large family of gram-negative bacteria that can 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. In 2018/19, the Field Services and HPT have also been working together to support Trusts across the region to consider reviewing and harmonising their approach to screening patients for CPE colonisation and protocols for isolation of high-risk or screen-positive patients. This work, informed by national CPE guidance, aims to result in greater harmonisation of practices between Trusts.

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 common but the disease (vomiting and some diarrhoea) is almost always self-limiting. Concern is higher in relation to outbreaks involving organisms which are associated with a greater burden of morbidity or even mortality: for example, *E. coli* O157 can cause serious illness including kidney damage, particularly among children.

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 certain incidents in hospitals, such as when outbreaks of notifiable diseases occur within hospital premises.

5.2 Numbers and types of incidents

In total, in 2018/19, the NE HPT was involved in investigating and where necessary managing 171 outbreaks, incidents and clusters (excluding GI care home outbreaks). This included 20 outbreaks in which formal incident /outbreak control teams were established by the HPT (compared with 18 in 2017/18). The causative agents in these outbreaks were widely varied, including norovirus, salmonella, *E. coli* O157, cryptosporidium, hepatitis A and tuberculosis. The premises involved also varied, including schools, restaurants, care homes, social clubs, a pet shop and a farm. Outbreaks of note in 2018/19 included:

- A cluster of *E coli* O157 cases among children who had visited a petting farm
- Two mass vaccination responses to hepatitis A cases in schoolchildren
- A community measles outbreak on Tyneside
- A pneumococcal outbreak in a care home
- A cryptosporidium outbreak associated with a pet shop

5.3 Hospital incidents/outbreaks

Incidents and outbreaks occurring in hospitals are the primary responsibility of NHS trusts and the response is typically led by the trust Director of Infection Prevention and Control. However, the HPT provides advice and support when necessary, calling in national advice as needed. In 2018/19 the HPT provided support in eight significant incidents (compared with 12 in 2017/18).

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 – 74
- 2019 – 16 up to 31/03/19

5.4 Gastrointestinal illness in care homes

In 2018/19 there were 267 outbreaks of GI illness in care homes compared with 327 in 2017/18, 250 in 2016/17, 275 in 2015/16, 328 in 2014/15, and 259 in 2013/14 (based on the date the outbreak was reported).

A probable causative organism was identified in 101 of the 2018/19 care home outbreaks of GI illness:

- Norovirus in 84 outbreaks
- Astrovirus in 8 outbreaks
- Rotavirus in five outbreaks
- Sapovirus in two outbreaks
- *C. perfringens* in two outbreaks

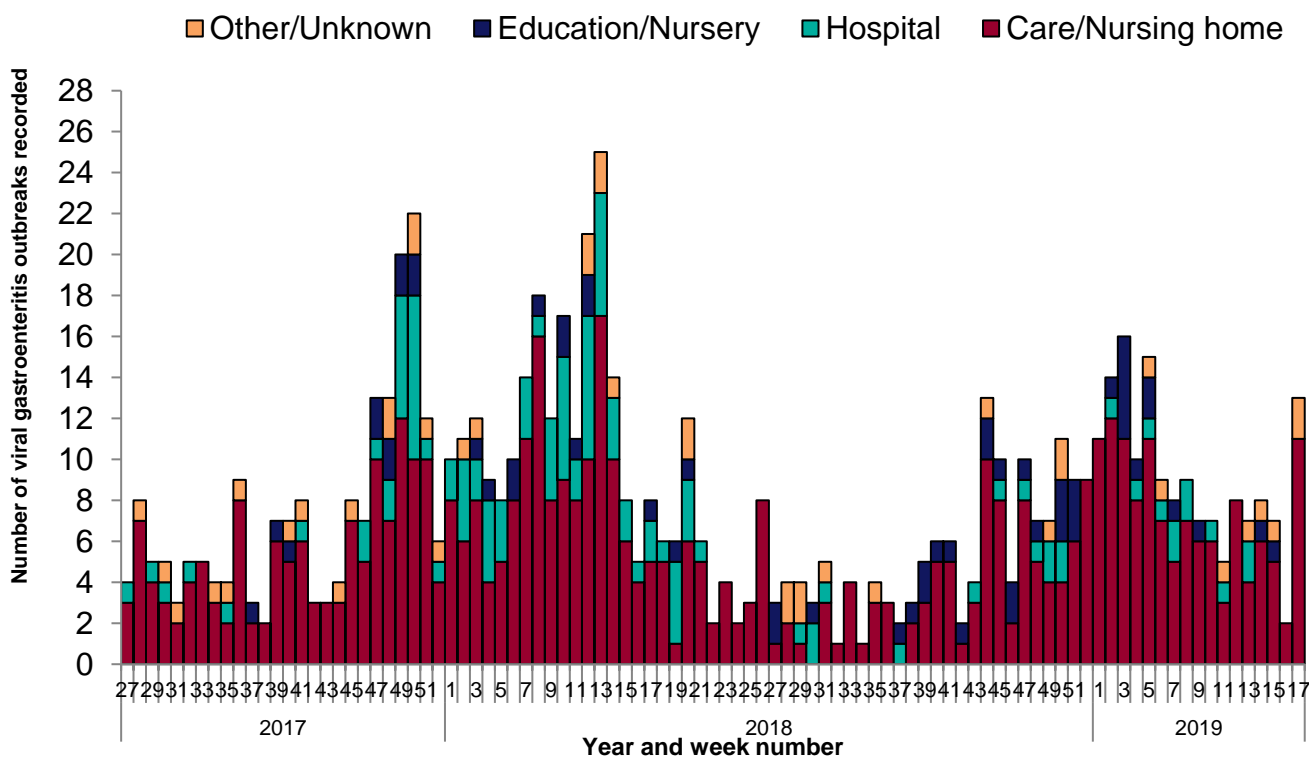
No pathogen was identified in the remaining 166 outbreaks, which were thought to be of viral cause.

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 Service team provides a weekly report on gastrointestinal infectious diseases (Figure 5.1). This shows all gastrointestinal infectious disease outbreaks across the North East, demonstrating the variation seen by season and between years

Figure 5.1: All reports of viral gastrointestinal infectious disease outbreaks (suspected or confirmed) by setting in North East week 27, 2017 to week 17, 2019



6. Health protection in a prison setting

Prison settings are important for health protection due to the number of vulnerable prisoners held in close proximity which can allow infections to spread easily. Public Health in Prisons North East meetings which started in 2017 continued in 2018 and provide a forum for the discussion and dissemination of issues relating to public health within the North East custodial estate. In addition, two health protection training events were held in September and October 2018 for operational prison staff building on the work delivered in the previous year.

Blood-borne viruses

Blood-borne virus work (hepatitis B, C and HIV) has continued throughout the year. 4,500 dry blood spot tests were carried out in the seven prisons throughout 2018. Of those tested eight were found to be positive for hepatitis B, 367 cases of hepatitis C and 17 cases of HIV. Approximately 81% of the new receptions entering the prison estate were offered a test and of those 23% engaged as part of their reception screening however this increased to 36% engagement when total tests are included. Further work is planned in the coming year to work with providers to increase the uptake rate of tests within the prisons. The Hepatitis C Trust has started recruiting for work within the prisons using a peer model approach to reduce stigma and increase testing.

Syphilis

The North East pilot of a universal offer of syphilis testing was started in April 2018 initially for six months but subsequently extended following a brief period where testing was halted. The pilot used dried blood-spot testing for syphilis in two North East prisons (HMP/YOI's Durham and Low Newton).

Since the start of the pilot 2,951 tests across the two prisons have been carried out and which identified two positive cases of syphilis that would not have been detected under the previous 'target tested' approach. Figure 1 illustrates the uptake rate of testing compared to the total number of receptions in each prison.

TB

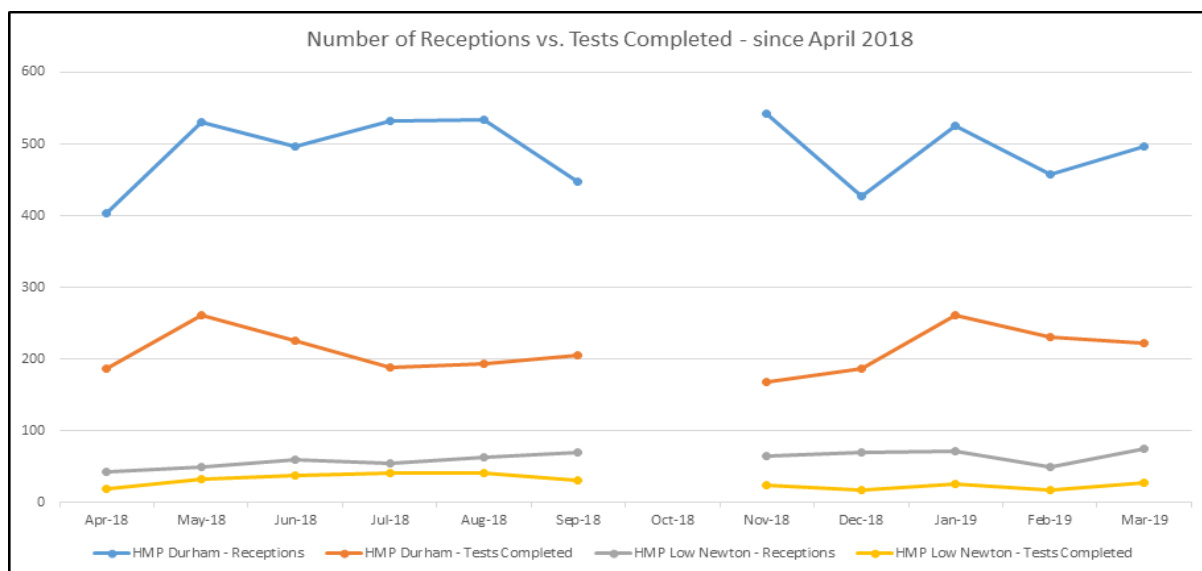
A TB baseline audit of all North East prisons was carried out by the Health and Justice lead and presented to the NEY&H TB Control board. Key findings and recommendations included:

- The number of reported TB cases within the North East prisons and community is low.
- There have been ten cases of TB within the North East Prisons since 2011
- There were 110 cases of TB within the NE community within 2017, 103 had information on a social risk factors (SRF) recorded. Of these, five had previous imprisonment as a SRF

- All staff need to be made aware of the signs and symptoms of TB and ongoing training support be available for staff as part of routine planning and preparation for prisoners with infectious diseases

As a result of this audit, further awareness training for prison staff is being arranged.

Figure 6.1: Number of syphilis tests completed as a proportion of receptions



7. Emergency preparedness, resilience and response (EPRR)

7.1. Preparedness

Structures and processes

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

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

The centre is represented on the three multi-agency Local Resilience Forums (LRFs) at strategic, tactical and sub group levels. The North East 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 has continued throughout 2018-2019 with full support from the PHE Centre which is represented on the NE Chemical, Biological, Radiation and Nuclear (CBRN) group. The centre is also 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 & Tees – of which the EPO is vice chair).

Plans

The 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.

There are a significant number of major industrial sites in the North East which are required to produce Control of Major Accident Hazards (COMAH) external 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 centre continues to ensure that COMAH and REPPiR plans for the north east 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 although revised national guidance is expected. A North East PHE Centre STAC Activation Plan is in place and the Directors of Public Health

provide the STAC chair role through an on-call rota through honorary contracts with PHE. A review of these arrangements will take place in 2019/20 to consider national guidance.

Exercises and training

EPRR staff are actively engaged in supporting the planning and management of multi-agency exercises across the region. In 2018-2019, these exercises included a range of scenarios such as IED detonation, heatwave, reservoir breach, recovery, aircraft crash with chemical release. Exercises have taken place at both tactical and strategic levels.

Internally, EPRR staff have engaged in a national exercise to test EU exit preparations and attended a workshop to produce the Single Adverse Weather Plan for England and to update the hot and cold weather alerting system. Also, training was delivered on the updated National Incident Emergency Response Plan and the consequent review of the North East Centre Incident Response Plan. Staff also attended a refresher session on using Resilience Direct.

PHE EPRR Peer Review

A national EPRR assurance peer review took place in January 2019 and local arrangements were reviewed by the East Midlands. Their evaluation was positive and contained a number of minor recommendations for further improvement which the health Protection Management Team have accepted and are implementing.

7.2. 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, escalating to 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.

8. Communications team

The PHE North East Communications team is part of the wider national PHE Communications directorate but also sits in the local centre to assist with long term communication planning, and internal and external stakeholder engagement.

The team use their local knowledge to inform national communications activity and use their expertise to respond to both local and national priorities. They work closely with NHS E, local authority and the wider public health system communication colleagues and provide 24/7 media relation support including frontline health protection work and emergency planning.

The team works closely with colleagues across the North to provide PR support to local and national campaigns and helps facilitate events, conferences and workshops. The team runs the North East social media account and provides media training to the wider public health system.

During 2018/19 the team worked closely with communication colleagues in our North East local authorities and NHS England via the public health communications network. It has also supported moves towards closer working via the Integrated Care Systems and Prevention communication workstreams.

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 Monkeypox and *E. coli* 0157. The team has supported multi-agency responses to influenza like illness, norovirus, scarlet fever and TB within various community settings; including supporting social media work to raise awareness of immunisation and prevention.

Working with the wider communications directorate the team has supported proactive work around measles outbreaks and helped promote key vaccination messages. It 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 heatwaves. The team has also worked closely across on emergency planning including close participation in Exercise Stephenson.

The team, working in partnership with the public health communication network facilitates mutual support and shared learning and this partnership is instrumental in providing key public relations support to a range of national and local marketing campaigns such as Keep Antibiotics Working, Clean Air Day, Smokefree NHS, Help Us Help You and World TB Day. As well as supporting national campaigns and initiatives the team works closely with north east communication colleagues to support a range of local initiatives and campaigns.

9. 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 have published a review of interventions for improving outdoor air quality and health, a comprehensive overview of actions that national and local government and others can take to improve air quality and health.

PHE has supported local councils and the Defra / Department for Transport (DfT) Joint Air Quality Unit (JAQU) with progression of plans to bring about compliant nitrogen dioxide (NO₂) levels, and ideally in parallel deliver wider health co-benefits by encouraging active travel and reducing the burden of air pollution more generally.

The EHE department covers all of England, with EHE staff locally also contributing to national workstreams and duty desk. In 2018/19 in the North East Region CRCE EHE and the HPT have:

- Supported local authorities in developing business cases for work plans to address nitrogen dioxide exceedances,
- Continued to provide 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. Of particular note are the fire and diesel contamination at Evenwood, Co Durham fire and the Alex Smiles waste fire in Deptford, Sunderland.
- CRCE have provided 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. Similarly, CRCE support multiagency contingency planning for high risk waste sites, such as the Alex Smiles site in Deptford Sunderland which had a major fire in May 2018, requiring setup of the national Air Quality Cell between PHE and Environment Agency (EA) and deployment of the EA's mobile monitoring teams for the acute phase of the incident.
- Developed scenarios for regional and national chemical exercises and supported the Health Protection Team in exercises with Scientific Technical Advice Cells for white powder and COMAH incidents.
- Delivered training to staff from the National Poisons Information Service in Newcastle to improve cooperation and alerting, for example for incidents where there are both clinical treatment and wider public health concerns, such as secondary exposure and contamination spread.
- Supported, presented at the South Tees Clean Air Strategy workshop.
- Delivered training at local universities.
- Provided training to Health Protection staff, and Specialty Trainees.

10. Improving the quality of health protection services

10.1. User satisfaction survey

The HPT have routinely surveyed users of the service since 2012. Questionnaires are sent to evaluate one in every ten enquiries. A total of 278 questionnaires were posted in 2018 and 154 returned (55%).

A summary of the key findings are as follows:

- 92% had contacted the HPT either once or twice in the previous 12 months.
- 98% said they were given the appropriate amount of information.
- 99% said that they had understood the advice given 'a lot' or 'completely'.
- 97% said that they had confidence in the response from the health protection nurse/practitioner.
- 97% of responders rated their overall satisfaction as either good, excellent or above average.

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

10.2. Research and Development

Over the last year, the Health Protection Team and Field Service team have continued to engage in academic work in order to share findings from their practice.

Publications in 2018/19 included:

- Papers in peer review journals – 8
- Oral presentations at national/international conferences – 2
- Poster presentations at national/international conferences – 6

A scoping exercise was conducted amongst the team to identify future research and audit questions and a structured programme of audit has been introduced amongst the health protection nursing and practitioner team for the year going forward. This aims to develop academic skills amongst the team and embed a culture of quality improvement.

Further details of publications are included in Appendix 4.

Appendix 1: Notifications and other reports of infectious disease in North East residents in 2018

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	41	7.8	111	21.2	2	0.4	7	1.3	40	7.6	
		Darlington	5	4.7	12	11.3	1	0.9	3	2.8	3	2.8	
		Total	46	7.3	123	19.5	3	0.5	10	1.6	43	6.8	
	North of Tyne	Newcastle upon Tyne	31	10.5	75	25.4	2	0.7	9	3.0	17	5.7	
		North Tyneside	15	7.3	53	25.9	1	0.5	3	1.5	12	5.9	
		Northumberland	4	1.3	60	18.8	0	0.0	3	0.9	17	5.3	
		Total	50	6.1	188	22.9	3	0.4	15	1.8	46	5.6	
	South of Tyne & Wear	Gateshead	18	8.9	43	21.2	4	2.0	12	5.9	21	10.4	
		South Tyneside	11	7.4	16	10.7	1	0.7	3	2.0	21	14.0	
		Sunderland	13	4.7	43	15.5	0	0.0	6	2.2	35	12.6	
		Total	42	6.7	102	16.2	5	0.8	21	3.3	77	12.2	
	Tees	Hartlepool	9	9.7	17	18.3	0	0.0	4	4.3	0	0.0	
		Middlesbrough	18	12.8	19	13.5	3	2.1	4	2.8	0	0.0	
		Redcar and Cleveland	7	5.1	13	9.6	1	0.7	11	8.1	1	0.7	
		Stockton-on-Tees	21	10.7	45	22.9	0	0.0	2	1.0	10	5.1	
		Total	55	9.7	94	16.6	4	0.7	21	3.7	11	1.9	
	Total		193	7.3	507	19.2	15	0.6	67	2.5	177	6.7	
	England & Wales	Total		2599 ³	4.4	6,735 ³	11.5	284 ³	0.5	268 ³	0.5	2,613 ³	4.4

1 Data source: EpiNorth3, 2018 data, Diagnosis (confirmed and probable cases).

2 Data source: EpiNorth3, 2018 data, Diagnosis (confirmed cases).

3 Data source: NOIDS, 2018 data used. Local and national data are not

4 Data source: HPZone 2018 data for England only.

5 Data source: SGSS, 2018 data. Laboratory confirmed cases only. Data for England only.

6 Data source: Enhanced Tuberculosis Surveillance (ETS), 2018 data.

7 Data source: Enhanced Tuberculosis Surveillance (ETS), 2018 data for England only.

All rates are per 100,000 population, calculated using mid-year population estimates for mid-2017 from the Office of National Statistics (ONS)

Protecting the population of the North East from communicable disease and other hazards. Annual Report 2018/19

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	14	2.7	85	16.2	616	117.6	90	17.2	2	0.4
		Darlington	1	0.9	19	17.9	110	103.4	11	10.3	0	0.0
		Total	15	2.4	104	16.5	726	115.2	101	16.0	2	0.3
	North of Tyne	Newcastle upon Tyne	8	2.7	51	17.2	355	120.0	35	11.8	0	0.0
		North Tyneside	7	3.4	33	16.1	295	144.3	29	14.2	4	2.0
		Northumberland	6	1.9	30	9.4	437	137.0	60	18.8	3	0.9
		Total	21	2.6	114	13.9	1,087	132.7	124	15.1	7	0.9
	South of Tyne & Wear	Gateshead	2	1.0	28	13.8	213	105.2	21	10.4	5	2.5
		South Tyneside	3	2.0	18	12.0	130	86.9	27	18.1	5	3.3
		Sunderland	4	1.4	41	14.8	263	94.9	29	10.5	2	0.7
		Total	9	1.4	87	13.8	606	96.3	77	12.2	12	1.9
	Tees	Hartlepool	4	4.3	10	10.8	135	145.1	8	8.6	0	0.0
		Middlesbrough	7	5.0	11	7.8	230	163.5	23	16.4	1	0.7
		Redcar and Cleveland	3	2.2	22	16.2	262	192.6	27	19.9	5	3.7
		Stockton-on-Tees	2	1.0	27	13.7	315	160.3	16	8.1	3	1.5
		Total	16	2.8	70	12.4	942	166.4	74	13.1	9	1.6
	Total		61	2.3	375	14.2	3361	127.1	376	14.2	30	1.1
	England & Wales	Total	555 ⁴	1.0	9,935 ⁵	16.9	60,109 ⁵	102.3	5,201 ⁵	8.9	373 ⁵	0.6

1 Data source: EpiNorth3, 2018 data, Diagnosis (confirmed and probable cases).

2 Data source: EpiNorth3, 2018 data, Diagnosis (confirmed cases).

3 Data source: NOIDS, 2018 data used. Local and national data are not

4 Data source: HPZone 2018 data for England only.

5 Data source: SGSS, 2018 data. Laboratory confirmed cases only. Data for England only

6 Data source: Enhanced Tuberculosis Surveillance (ETS), 2018 data.

7 Data source: Enhanced Tuberculosis Surveillance (ETS), 2018 data for England only.

All rates are per 100,000 population, calculated using mid-year population estimates for mid-2017 from the Office of National Statistics (ONS)

Protecting the population of the North East from communicable disease and other hazards. Annual Report 2018/19

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	0	0.0	16	3.1	101	19.3	7	1.3	15	2.9	
		Darlington	0	0.0	10	9.4	16	15.0	1	0.9	5	4.7	
		Total	0	0.0	26	4.1	117	18.6	8	1.3	20	3.2	
	North of Tyne	Newcastle upon Tyne	2	0.7	66	22.3	104	35.2	10	3.4	39	13.2	
		North Tyneside	0	0.0	11	5.4	32	15.6	9	4.4	9	4.4	
		Northumberland	3	0.9	7	2.2	51	16.0	8	2.5	6	1.9	
		Total	5	0.6	84	10.3	187	22.8	27	3.3	54	6.6	
	South of Tyne & Wear	Gateshead	0	0.0	13	6.4	94	46.4	7	3.5	6	3.0	
		South Tyneside	1	0.7	8	5.3	27	18.1	2	1.3	5	3.3	
		Sunderland	0	0.0	19	6.9	49	17.7	4	1.4	9	3.2	
		Total	1	0.2	40	6.4	170	27.0	13	2.1	20	3.2	
	Tees	Hartlepool	0	0.0	5	5.4	17	18.3	1	1.1	4	4.3	
		Middlesbrough	2	1.4	27	19.2	55	39.1	2	1.4	13	9.2	
		Redcar and Cleveland	0	0.0	2	1.5	20	14.7	5	3.7	3	2.2	
		Stockton-on-Tees	0	0.0	15	7.6	33	16.8	2	1.0	8	4.1	
		Total	2	0.4	49	8.7	125	22.1	10	1.8	28	4.9	
	Total		8	0.3	199	7.5	599	22.6	58	2.2	122	4.6	
	England & Wales	Total		741 ⁴	1.3	4,413 ⁴	7.9	6,057 ⁴	10.9	1,368 ⁴	2.5	4,668 ⁷	8.4

1 Data source: EpiNorth3, 2018 data. Diagnosis (confirmed and probable cases).

2 Data source: EpiNorth3, 2018 data, Diagnosis (confirmed cases).

3 Data source: NOIDS, 2018 data used. Local and national data are not

4 Data source: HPZone 2018 data for England only.

5 Data source: SGSS, 2018 data. Laboratory confirmed cases only. Data for England only

6 Data source: Enhanced Tuberculosis Surveillance (ETS), 2018 data.

7 Data source: Enhanced Tuberculosis Surveillance (ETS), 2018 data for England only.

All rates are per 100,000 population, calculated using mid-year population estimates for mid-2017 from the Office of National Statistics (ONS)

Appendix 2: Schedule of routine PHE North East infectious disease surveillance reports

	Output¹	Frequency	Email Recipients
Reports sent to external partners	SGSS Trust Feedback Report (SGSS Weekly Laboratory report)	Weekly	HPT, FS NE, CPHI, ATMs
	Influenza and influenza-like illness (ILI) Bulletin	Weekly	HPT, FS NE, CPHI, SIT, PHE Regional Office, CCGs, NHSE, ATMs, emergency planners, others
	Infectious Intestinal Disease (IID) Bulletin	Weekly	HPT, FS NE, CPHI, SIT, PHE Regional Office, CCGs, NHSE, ATMs, emergency planners, others
	Seasonal Respiratory Disease Report	Weekly	HPT, FS NE, CPHI, virologists, contributing ATMs
	HCAIs Monthly Summary	Monthly	HPT, FS NE, SIT, CPHI, ICNs, ATMs
	IPD Laboratory Audit Report	Monthly	FS NE, CPHI, ATMs
	Care Home outbreak report	Monthly	HPT, FS NE, DsPH,
	Health Protection Surveillance Report ²	Quarterly	HPT, FS NE, CPHI, SIT, DsPH, LA EHOs, ATMs
	Vaccine Preventable Diseases (VPD) Bulletin	Quarterly	HPT, FS NE, CPHI, SIT, DsPH, ATMs
	Anti-Microbial Resistance (AMR) Report	<i>Quarterly (under review)</i>	HPT, FS NE, CPHI, ATMs, ICNs
	Report on Carbapenem-Resistant Enterobacteriaceae (CRE) and Carbapenemase-Producing Enterobacteriaceae (CPE)	Quarterly	HPT, FS NE, CPHI, ATMs
	Sexual Health Bulletin	Quarterly	HPT, FS NE, CPHI, SH Leads, DsPH, ATMs, GUM consultants, ID physicians
	STI Spotlight Report	Annual	HPT, FS NE, CPHI, SH Leads, DsPH, ATMs, GUM consultants, ID physicians
	HIV Spotlight Report	Annual	HPT, FS NE, CPHI, SH Leads, DsPH, ATMs, GUM consultants, ID physicians
	LASER report (STI)	Annual	HPT, FS NE, DsPH
	Annual TB Report	Annual	HPT, FS NE, CPHI, TB leads, TB clinicians, ATMs
Campylobacter Report	Annual	HPT, FS NE, CPHI, LA EHOs, ATMs	
Salmonella Report	Annual	HPT, FS NE, CPHI, LA EHOs, ATMs	

Protecting the population of the North East from communicable disease and other hazards. Annual Report 2018/19

	Output¹	Frequency	Email Recipients
	Annual Hepatitis C Report	Annual	HPT, FS NE, CPHI, DsPH, ID physicians, virologists, ODN, Drug action teams
	Annual Hepatitis B Report	Annual	HPT, FS NE, CPHI, DsPH, ID physicians, virologists, ODN, Drug action teams
	IPD Annual Report	Annual	HPT, FS NE, CPHI, ATMs, ID physicians, GP via CCG
Reports for HPT/FET NE	EpiNorth3 Exceedance Alert	Daily	HPT, FS NE
	EpiNorth3 Typing Coincidence Alert	Daily	HPT, FS NE
	EpiNorth3 Postcode Coincidence Alert	Daily	HPT, FS NE
	EpiNorth3 Exceedance Report	Weekly	HPT, FS NE
	EpiNorth3 Postcode sector Report	Weekly	HPT, FS NE
	E piNorth3 Exposures Exceedance Report	Weekly	HPT, FS NE
	EpiNorth3 Weekly Case Summary Report	Weekly	HPT, FS NE
	SGSS Quarantined Data Report	Weekly	HPT, FS 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)	FS NE	Field Service North East
ATMs	Acute Trust Microbiologists	ICNs	Infection Control Nurses
SIT	Screening & Immunisation Team	CPHI	Consultant in Public Health Infection
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 FS)

Papers published in peer review journals

- Campbell H, Gupta S, Dolan G, Kapadia S, Kumar Singh A, Andrews N, Amirthalingam G. 17/09/2018. J. Med. Microbiol. 67(10):1426-1456 doi:10.1099/jmm.0.000829 **Review of vaccination in pregnancy to prevent pertussis in early infancy.** Journal of Medical Microbiology
- Houseman C, Chapman KE, Manley P, Gorton R, Wilson D, Hughes G. (2019). Decreasing case fatality rate following invasive pneumococcal disease, North East England, 2006-2016. Epidemiology and Infection. 147.10.1017/S0950268819000657. **Decreasing case fatality following invasive pneumococcal disease, North East England, 2006-2016.** Epidemiology & Infection.
- A. Waldram¹, J. Lawler², C. Jenkins³, J. Collins⁴, M. Payne⁴, H. Aird⁵, M. Swindlehurst⁵, G. K. Adak⁶, K. Grant³, D. Ready³, R. Gorton¹ and K. Foster² Epidemiology and Infection 1–8. <https://doi.org/10.1017/S095026881800225X>. **Large outbreak of multiple gastrointestinal pathogens associated with fresh curry leaves in North East England, 2013.** Epidemiology & Infection
- Richard Elson,^{1,2*} Adedoyin Awofisayo-Okuyelu,² Trevor Greener,³ Craig Swift,¹ Anaïs Painset,^{1,2} Corinne Françoise Laurence Amar,¹ Autilia Newton,⁴ Heather Aird,⁵ Mark Swindlehurst,⁵ Nicola Elviss,⁵ Kirsty Foster,⁶ Timothy J. Dallman,^{1,2} Ruth Ruggles,¹ and Kathie Grant^{1,2}. Journal of food protection, vol. 82, no. 1, 2019, pages 30–38. **Utility of Whole Genome Sequencing to Describe the Persistence and Evolution of Listeria monocytogenes Strains within Crabmeat Processing Environments Linked to Two Outbreaks of Listeriosis.** Journal of Food Protection
- K Fenton ,¹ A Cropp,¹ M Chauhan,¹ K Foster,² J Harwood,¹ C Lyth,¹ DA Price,³ M Valappil¹ and D Weiland¹. HIV Medicine (2018), 19, e77 DOI: 10.1111/hiv.12673. **Earlier diagnosis of HIV infection through visual HIV testing prompts.** HIV Medicine
- Maeve K. Lalor^{1,2}, Nicola Casali^{3,4}, Timothy M. Walker⁵, Laura F. Anderson¹, Jennifer A. Davidson¹, Natasha Ratna¹, Cathy Mullarkey⁶, Mike Gent⁷, Kirsty Foster⁸, Tim Brown³, John Magee^{9,10}, Anne Barrett⁹, Derrick W. Crook^{5,11}, Francis Drobniowski^{3,4}, H. Lucy Thomas¹ and Ibrahim Abubakar^{1,2}. Eur Respir J 2018; 51: 1702313 [<https://doi.org/10.1183/13993003.02313-2017>]. **The use of whole-genome sequencing in cluster investigation of a multidrug resistant tuberculosis outbreak.** European Respiratory Journal
- Bridie Howe, * Medhat Basta, Kirsty Foster, Umo Esen, Richard Ellis, Jane Hussey. European Journal of Obstetrics & Gynecology and Reproductive Biology 219 (2017) 131–136. **Primary syphilis in pregnancy mistaken for genital herpes: A preventable cause of congenital syphilis.** European Journal of Obstetrics & Gynaecology and Reproductive Biology
- A Bhagey¹, K Foster², S Ralph¹, AWardropper¹, C White¹, V Wholey¹ and S Duncan¹. International Journal of STD & AIDS 2018, Vol. 29(10) 1007–1010. **High prevalence of anti-hepatitis A IgG in a cohort of UK HIV-negative men who have sex with men: implications for local hepatitis A vaccine policy.** International Journal of STD & AIDS

Oral presentations on research to conferences

- Nicola Love, Deborah Wilson, Claire Stoker: Salmonella outbreak linked to a rural butcher shop with unusually severe clinical presentation, February-March 2018, North East England. European Scientific Conference on Applied Infectious Disease Epidemiology
- Michelle Henderson, Simon Howard: Screening for latent tuberculosis in UK healthcare workers. UK TB Educational Symposium, London

Poster presentations on research to conferences

- Kate Houseman, Kaye Chapman, Deborah Wilson. Decreasing 30 day mortality following invasive pneumococcal disease, North East of England 2006-2016. 5 Nations Health Protection Conference
- Peter Acheson, Kelly Stoker. Campylobacter parfait – an old favourite with a novel twist. 5 Nations Health Protection Conference
- Stephanie Baker, Gayle Dolan. Increasing the participation in oral fluid surveillance for measles cases reported to the North East Health Protection Team. 5 National Health Protection Conference
- Eve Hamilton, Simon Howard. To treat or not to treat? A complex decision in TB care. Federation of Infection Societies Conference, Gateshead
- Rachael Kain, Simon Howard. The measles on the bus goes round and round: community and hospital infection control lessons from a small measles outbreak on Tyneside. Healthcare Infection Society Annual Conference, Liverpool
- Kelly Stoker, Gayle Dolan. Outbreak of Pneumococcal and Influenza infection in a care home in the North East of England January 2018. Healthcare Infection Society Annual Conference, Liverpool

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.