UK Health Security Agency

Infectious diseases impacting England: 2025 report

About UKHSA

The UK Health Security Agency prepares for and responds to infectious diseases, and environmental hazards, to keep all our communities safe, save lives and protect livelihoods.

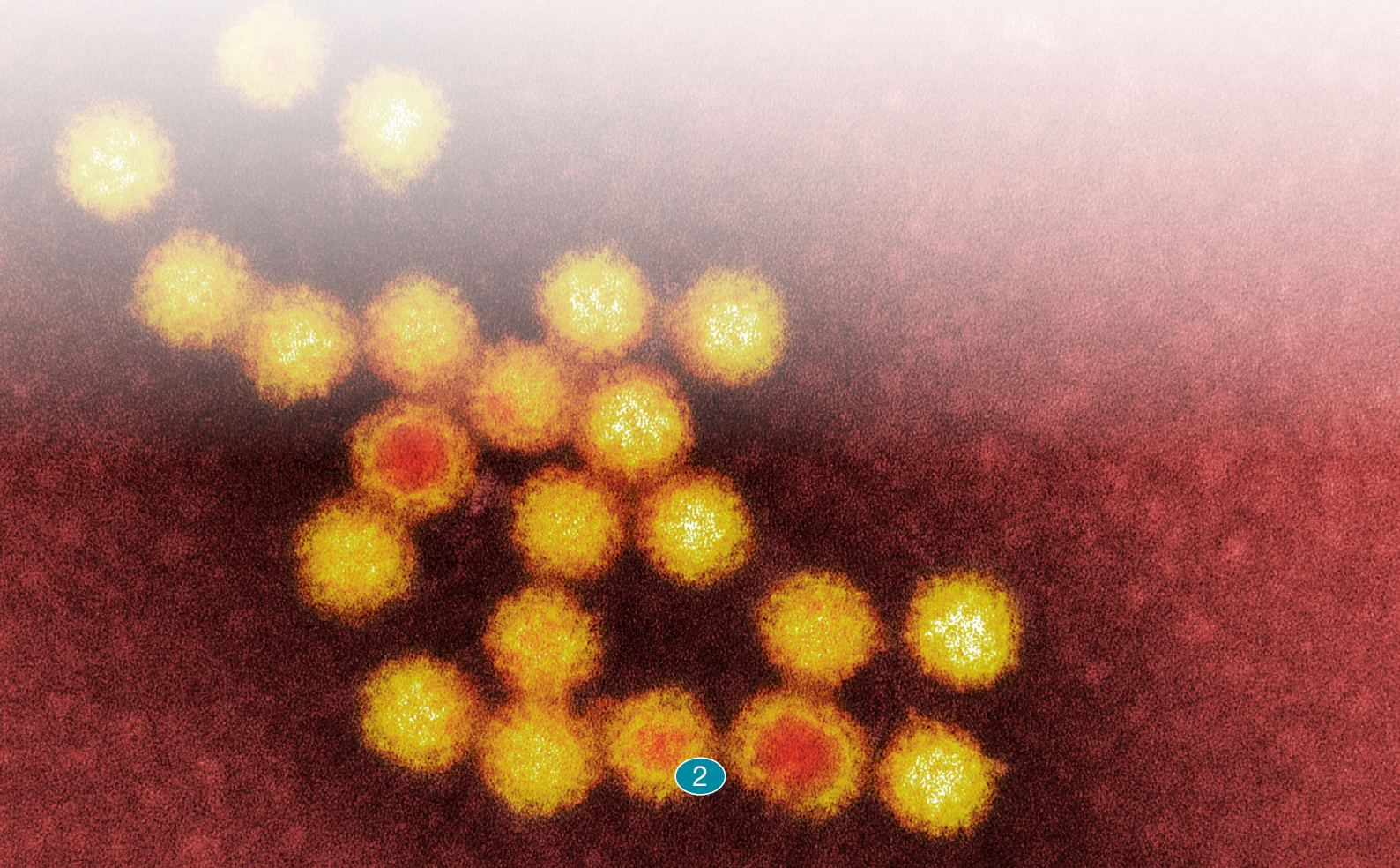
We provide scientific and operational leadership working with local, national and international partners to protect the public's health and build the nation's health security capability.

UKHSA is an executive agency, sponsored by the Department of Health and Social Care (DHSC).

For most of UKHSA's work, our remit covers England as health protection is largely a devolved policy area. We hold some UK-wide responsibilities on reserved matters where the UK government has retained policy responsibility.

Our work extends globally through our scientific engagements and operational response.

UKHSA recognises the cross-border nature of health threats and health inequalities and works in close partnership with the devolved governments on common challenges.



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Foreword

One of the pillars of our mission at the UK Health Security Agency (UKHSA) is preparing and responding to threats posed by infectious diseases. The collection of data for this purpose is crucial. Having robust data empowers us to make informed decisions about where our attention should be focused, and how we can best support those disproportionately affected by the burden of infectious disease.

This is why we have published our first annual report on Infectious Diseases Impacting England, with data spanning the period from 2023 to early 2025. This was a time in which, due to the impact of the COVID-19 pandemic, we have seen considerable change in the epidemiology of some diseases, improvement in our capabilities and, necessarily, reprioritisation in our actions to address the harmful impacts.

Social restrictions reduced the transmission of almost all infectious diseases during the pandemic, and inevitably the return of social mixing led to increasing cases of a number of endemic and epidemic infectious diseases.

In comparison to those from less deprived areas, we know that people living in and with deprivation have worse health outcomes from infectious disease. In England from 2023 to 2024, hospital admission rates due to infectious disease and infection were nearly twice as high for people in the 20% most deprived areas, as compared to the least deprived.

In order to take action, it is crucial that these data are accessible to all – whether professionals who need them to inform their research or response, or the public so that they can make decisions important to each one of them in their daily lives. We can all benefit from learning more about the infectious diseases affecting this country and what action we can take.

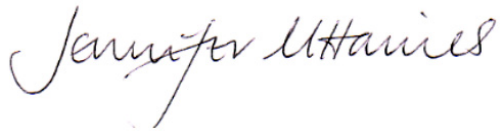
However, it's also the case that even where we can amend the pattern of disease for the better, we are not using that protection for maximum effect. The most obvious example is the decline over the last decade of vaccine uptake for a number of

childhood infectious diseases, meaning preventable infections, such as measles and whooping cough, have shown marked resurgence and sadly children have died.

This report sets out the current picture of a number of diseases, but it is also full of examples of the proactive work we do to prepare for and respond to infectious disease threats, from surveillance of avian influenza at farms where zoonotic outbreaks have occurred, to our early detection and management of the first 10 cases of clade 1b mpox in the England. We are also seeing encouraging initial results following the introduction of the new RSV vaccination programme in September 2024.

But while our continually developing scientific capability and work to introduce new effective interventions are having positive impacts on the safety and wellbeing of the communities we serve, the report also tells us this: we still have much work we can and should do. We have new tools at our disposal, a brilliant scientific and operational workforce and we need to be bolder. Behind these data are our families, our friends, our communities and our colleagues. There are people who are sick, at known risk of disease, and in some cases dying.

We need to use the knowledge that our rich data sources afford us and move forward with strong ambition to reduce the burden of infectious diseases and ensure our messaging and interventions reach the people who need them most.



Dame Jenny Harries

Chief Executive, UKHSA

Infectious diseases impacting England: experiences since the COVID-19 pandemic

This report is the first annual summary of infectious diseases impacting England from the UK Health Security Agency (UKHSA). It provides a summary of the status of infections of public health importance for the most recent years in which UKHSA has published data, and of the work being delivered by the Agency and its partners to control and prevent their spread and harmful impact.

This first report focuses particularly on the post-pandemic period from 2023 onwards, a period in which a number of factors have altered the spread of endemic and epidemic infectious diseases. The COVID-19 pandemic and associated social restrictions reduced the transmission of almost all infectious diseases, with alterations in healthcare delivery also disrupting the delivery of a variety of public health programmes such as routine vaccination. The return of social mixing and international travel, particularly since 2022, together with changing migration patterns has been associated with the re-emergence, re-establishment and re-surgence of a number of endemic and epidemic infectious diseases.

UKHSA has been at the forefront of tackling these increases, working closely with the NHS and local systems to ensure optimal prevention and control measures are in place. In addition, UKHSA continues to develop the evidence base for new interventions to support further policy development and action with the aim of reducing the transmission and mitigating the harmful impact of these infections on the lives and livelihoods of the people of England.

Respiratory infections

Seasonal respiratory viruses such as influenza and respiratory syncytial virus (RSV) are a major cause of morbidity and mortality in the population and impact on the health care system each winter. The circulation of seasonal respiratory viruses was disrupted during the early stages of the COVID-19 pandemic and the associated response, but since the return of social mixing and travel, rates of infection have increased again. The spread and ultimately the impact of many of these infections can be reduced by various interventions, in particular vaccination.

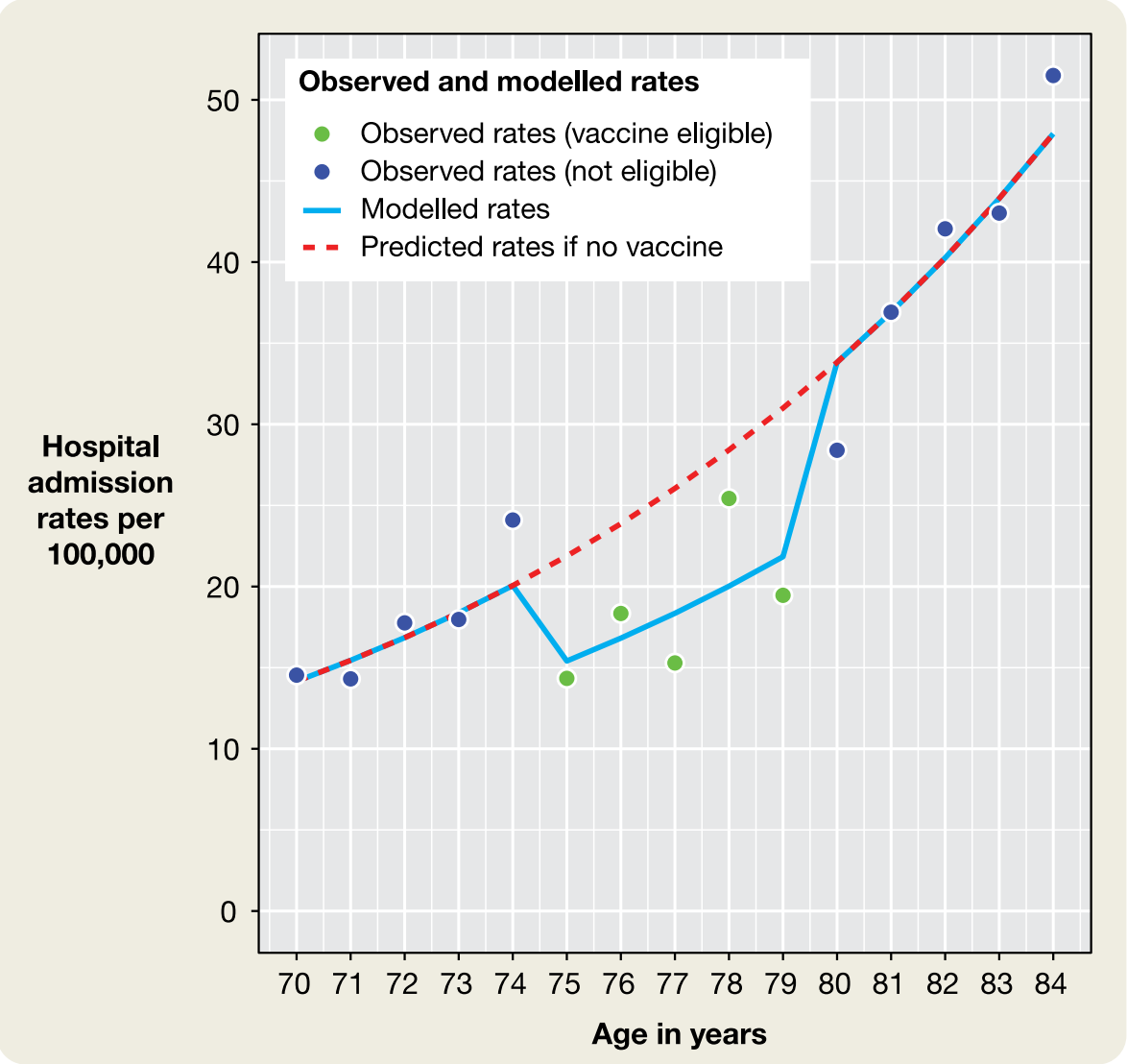
2023/24 **flu vaccine** uptake in older adults **exceeded** WHO target

The 2023-24 winter season saw the co-circulation of influenza, RSV and SARS-CoV-2 for the second consecutive season following the relaxation of public health and social measures after the COVID-19 pandemic. Following initial spread of RSV in early autumn 2023, England saw the co-circulation of influenza A(H3N2), A(H1N1) pdm09 and B/Victoria, but not B/Yamagata (which the pandemic restrictions eliminated from circulation) (1). To improve vaccine effectiveness (VE) in the population, following evidence and evaluation from UKHSA and advice from JCVI, the influenza vaccine programme has seen the introduction of a number of newly licensed vaccines in recent years, including adjuvanted, cell-based and recombinant vaccines. Our VE monitoring found moderate to good protection for the 2023 to 2024 influenza season in both children and adults (2). However, influenza vaccination rates in pre-school children, pregnant women, those under the age of 65 at risk and healthcare workers have fallen since the pandemic, ranging from 32 to 44% (3,4). Further work is needed to improve uptake in these key groups. On a more positive note, vaccine uptake in older adults in 2023/24 exceeded the World Health Organization (WHO) target of 75% for a fourth consecutive season (3).

30% reduction in **confirmed RSV** hospital admission rate in **75** to **79-year-olds**

The burden of RSV disease particularly falls on infants and the elderly, with the 2024-25 season seeing the introduction of two new RSV vaccination programmes. One programme for women who are at least 28 weeks pregnant, to protect their infants, and another initially for adults 75 to 79 years of age, using the Abrysvo® RSV vaccine (Pfizer Limited) (5). UKHSA continues to analyse and evaluate these new programmes, with early assessment of the RSV vaccine programme in older adults showing it had led to a 30% reduction in the confirmed RSV hospital admission rate in eligible 75-79 year olds (6) (Figure 1). The RSV vaccination programme in pregnant women and the potential impact it has had on protecting infants will take longer to assess.

Figure 1. RSV hospital admission rates 4 November 2024 to 6 January 2025 by year of age [at 1 Sept] in 70 to 84 year olds in England, including predicted admission rate for 75 to 79 year olds in the absence of vaccination



COVID-19 continued to circulate through the 2023-24 winter season at baseline levels, with the JN.1 variant, and its descendants in the KP.3 and XEC lineages, becoming dominant (7). Incremental vaccine effectiveness in each campaign was around 45% against hospitalisation, with vaccine uptake in older age groups at 60-70% (8). Vaccination of priority groups, in particular the elderly, remains an important intervention to protect against severe disease. In addition, selection of variant for the future vaccine campaigns, how closely these match predicted dominant strains, and how this impacts vaccine effectiveness remains an area of ongoing evaluation.

A range of other acute respiratory infections, in particular Legionella and *Mycoplasma pneumoniae*, can also result in epidemic activity. *Mycoplasma pneumonia* is often mild and improves without antibiotics. In severe cases a short course of antibiotics resolves symptoms. *Mycoplasma pneumoniae* epidemic peaks tend to occur every 4 to 7 years. Laboratory reports from the winter season of 2023 to 2024 indicate there was a prolonged and elevated epidemic period, with laboratory detections in January 2024 exceeding detections in the previous epidemic in 2019 to 2020 three-fold. From October 2023 to February 2024, hospital admissions with detected *Mycoplasma pneumoniae* were much higher than 2019/20 (617 compared to 110), particularly in children. This increase was most likely related to reduction in circulation during the pandemic and increased use of PCR testing to detect mycoplasma in the NHS over this period (9).

Mycoplasma pneumoniae epidemic peaks occur every **4 to 7 years**

Legionella cases are at **highest** level since **2017**

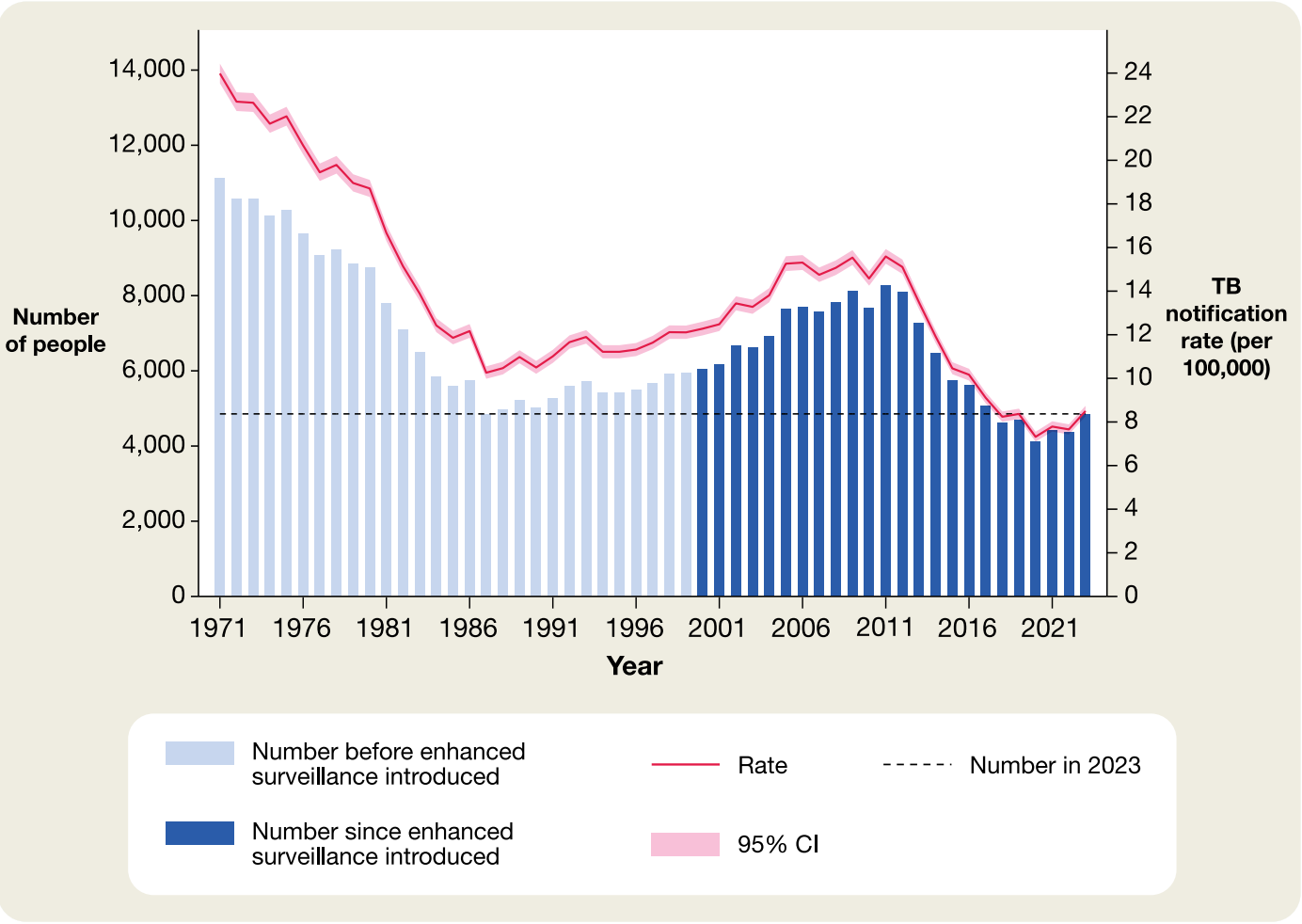
England has also seen a rise in Legionella, with UKHSA's latest annual report (focussing on 2023 data) showing 604 cases reported in England and Wales, the highest levels since 2017. It is likely that a number of factors have led to this observed increase, including improvements in detection and awareness, as well as genuine changes in the epidemiology linked in part to the impact of the pandemic. Early detection of Legionella cases is important to enable early implementation of control measures (10).

TB action plan aims to **improve prevention, detection** and **control**

Tuberculosis (TB) is the world's leading cause of death from a single infectious agent. TB continues to be associated with deprivation, with infection also common in large urban areas. In 2014 the WHO established its End TB Strategy, working towards the goal of zero deaths and suffering due to the disease, while in England UKHSA and NHSE have developed a TB action plan to improve the prevention, detection and control of the disease. However, the annual report for 2023 highlights that TB remains a serious

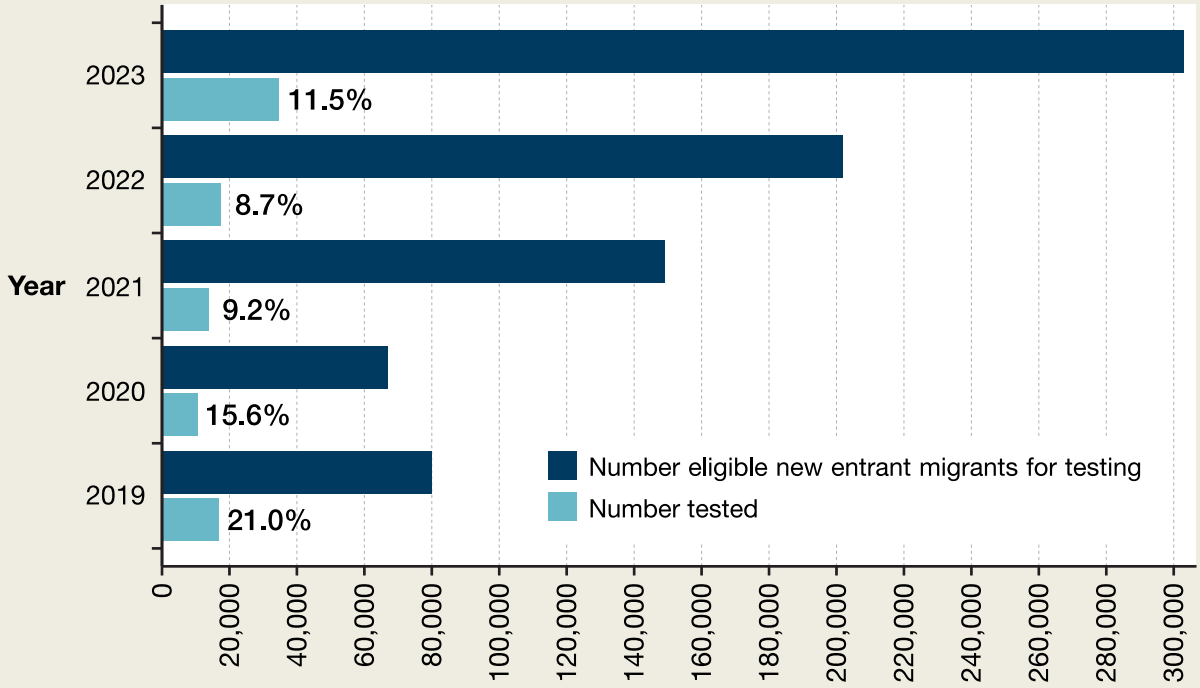
public health issue in England, with data showing reported notifications of TB in England having increased by 11% (almost 500 additional cases) in 2023, with 4,855 notifications of the disease compared with 4,380 in 2022 (11). Provisional annual data for 2024 shows that reported notifications increased by 13% compared to 2023 (over 600 additional cases) continuing the upward trend in recent years (Fig 2). The current rate of increase will see the UK lose its WHO low incidence status of 10/100,000 population.

Figure 2: Number of TB notifications and TB notification rate per 100,000, England, 1971-2023



There is a strong association between the increase in TB incidence and rise in migration from high or very high incidence countries, with 80% of all notifications in 2023 in people born outside the UK, despite a doubling in the number of people screened before entry to the UK between 2021 and 2023. The number of eligible new entrant migrants tested through the NHS Latent TB Infection programme was more than 35,000, but this represented only 11% of the total eligible cohort (Fig 3) (12). Work is underway to identify the optimal and most cost effective control and prevention strategies to tackle this increase.

Figure 3: Number of new migrants eligible for testing and number tested for latent TB per year with proportion tested, England, 2019-2023



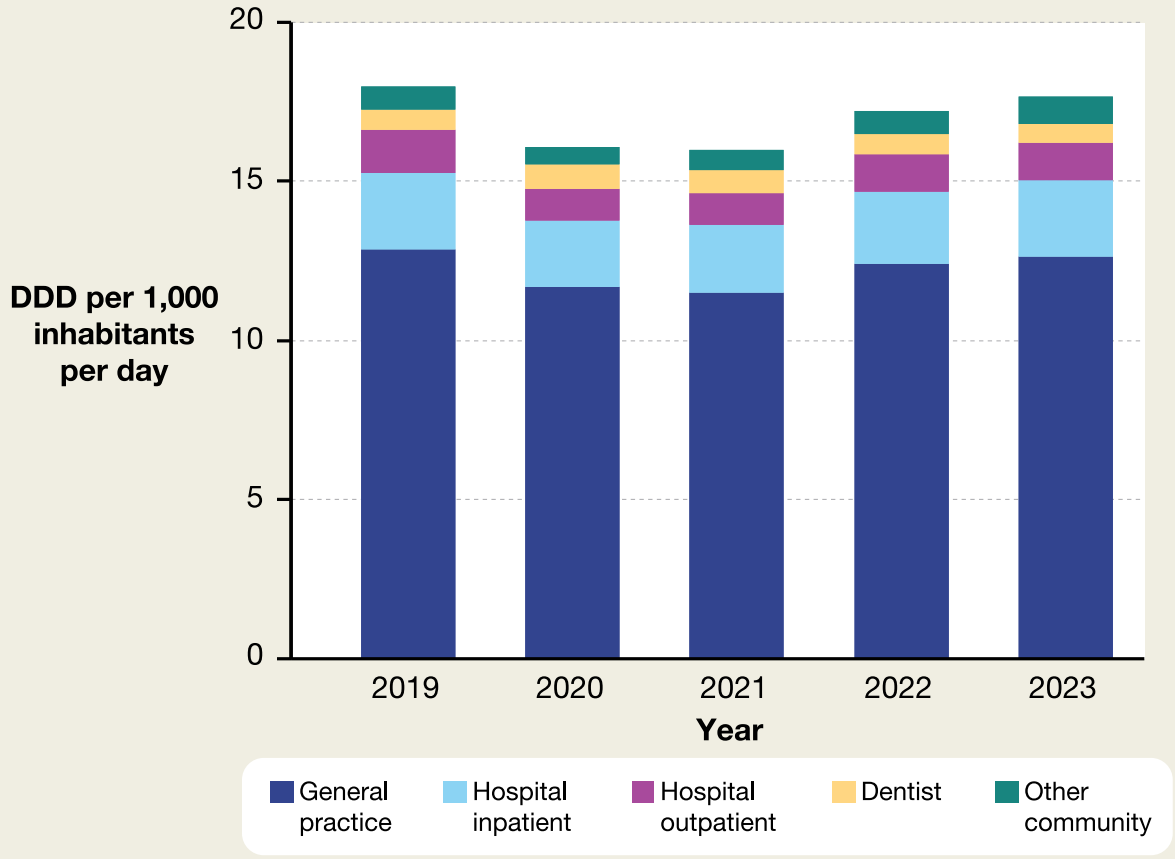
Healthcare-associated infection and antimicrobial resistance

Antimicrobial resistance (AMR) occurs when medicines used to fight infections lose their effectiveness because the organisms they target, whether bacteria, fungi, viruses or parasites, have evolved or adapted to survive. Sustained action is required to curb the inappropriate use of antibiotics and transmission of resistance bacteria, two of the main drivers of AMR. The UK has a 20-year vision for tackling the issue through a series of 5-year National Action Plans (NAPs), which aim to bring together organisations across government to contain, control and mitigate its impact. While England saw an initial reduction in the AMR burden (calculated by determining the rates of resistance to antibiotics in organisms selected for their public health importance including *E. coli*, *K. pneumoniae*, *K. oxytoca*, *Pseudomonas* spp., *Acinetobacter* spp., *S. aureus*, *Enterococcus* spp.,

AMR burden
in 2023
3.5%
higher than
2019

S. pneumoniae) in 2023 the burden surpassed 2019 levels by 3.5%. There were year on year increases in reported cases of individuals with resistant bloodstream infections reported since 2021 (13). As in previous years, the AMR burden varied markedly across the regions of England, with the highest rates seen in the London region. Variation in burden was also seen when patients were stratified by ethnicity, with the highest percentage of resistant organisms reported in the Asian ethnic groups (39.4%), almost double that seen when compared to White ethnic groups (20.1%). Antibiotic resistance also increased across most major antibiotic classes for *Klebsiella pneumoniae* between 2019 and 2023, while since 2021 the rates of reported carbapenemase-producing organisms (CPO) from all sample types have doubled. Total antibiotic consumption also increased by 2.4% between 2022 and 2023 in part linked to a national surge in Group A Streptococcus (GAS) cases (Fig 4). In the recent 2024-25 winter, cases of GAS infection were within normal levels for the time of year, and once available a comparison of antibiotic consumption data for this period will be undertaken.

Figure 4: Total antibiotic consumption by setting, expressed as defined daily doses (DDD), England 2019 to 2023



The UK's latest AMR action plan, published in May 2024, aims to further strengthen surveillance, antimicrobial stewardship, diagnostics and infection prevention and control interventions to reduce the impact of AMR on the population (9).

Blood-borne viruses

Blood-borne viruses (BBVs) are viruses that some people carry in their blood and can be spread from one person to another through blood and some other bodily fluids. Those infected with a BBV may show little or no symptoms of serious disease, but other infected people may be severely ill. There are three main blood-borne viruses in the UK at present: HIV, Hepatitis B, and Hepatitis C. The HIV Action Plan for England 2022-2025 set ambitious goals on how the UK would achieve an 80% reduction in new HIV infections by 2025. The latest annual HIV report for data to end 2023 shows that after decreases between 2019 and 2022, there were 2810 new diagnoses first made in England in 2023. This was an increase of 15% from 2022 to 2023, with slowing progress among women and ethnic minorities highlighting widening inequalities across the care pathway (14). In order to achieve the 2025 transmission target, HIV would need to fall by 627 new cases per year.

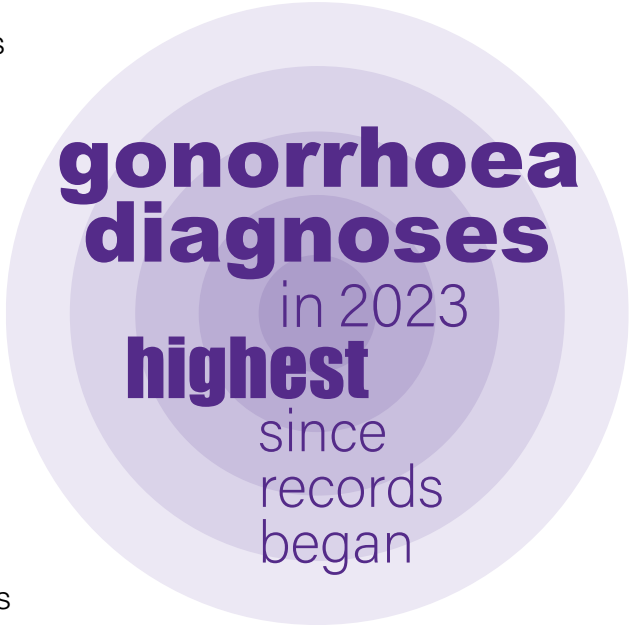
In December 2024, on World AIDS Day, the Prime Minister announced the expansion of Emergency Department (ED) HIV opt-out testing. UKHSA, DHSC and stakeholders are developing the next HIV Action Plan for 2025-2030, to be published this year, which will include refreshed and new actions, underpinned by evidence, to meet the needs of the changing epidemic and address stigma and inequities in access and outcomes.

In relation to Hepatitis B and C, the UK government has adopted the WHO's updated Global Health Sector Strategies to eliminate viral hepatitis as a public health problem by 2030. The latest hepatitis C (HCV) report, which includes data to the end of 2023, shows continued progress by England towards achieving these goals. From 2015 to 2023, the number of people living with chronic HCV infection in England has fallen dramatically in the general adult population by 56.7% and is now estimated at 55,900 due to improved testing and access to treatment. People who inject drugs are the main risk group for HCV infection and significant progress has been made to reduce the chronic prevalence, which is now at 7.2%. Interventions have reduced HCV-related mortality to 0.41 per 100,000 population, the lowest mortality rate for a decade (15). Focus is now being turned to determining what levels of prevention, testing and treatment interventions are required to maintain elimination status and tackle stigma.

For Hepatitis B (HBV), UKHSA currently estimates in 2022 there were around 270,000 people living with the virus, that is, 0.6% of the population, increasing to 1.5% in London. England has met and exceeded the WHO's absolute targets on HBV-related mortality, incidence of new infections, elimination of mother-to-child transmission and universal vaccine coverage among infants. Robust public health programmes and surveillance systems provide a strong platform for these achievements. However, there are risk areas in diagnosis, treatment engagement and vaccination that could potentially impact the goal of elimination of viral hepatitis as a public health threat in the WHO European region by 2030. Solutions include increasing the proportion of people living with HBV who are aware of their infection being diagnosed, referred and engaged in

care, and tackling declining vaccine coverage in groups at high risk of infection, such as people who inject drugs. WHO and European clinical guidelines will widen the criteria for treatment and, these combined with the high number of new diagnoses of HBV from the ED opt out testing sites, is expected to increase demands on NHS hepatology services. Different models of care, and improvements to the treatment and care pathway are therefore being considered (16).

Sexually transmitted infections (STI)



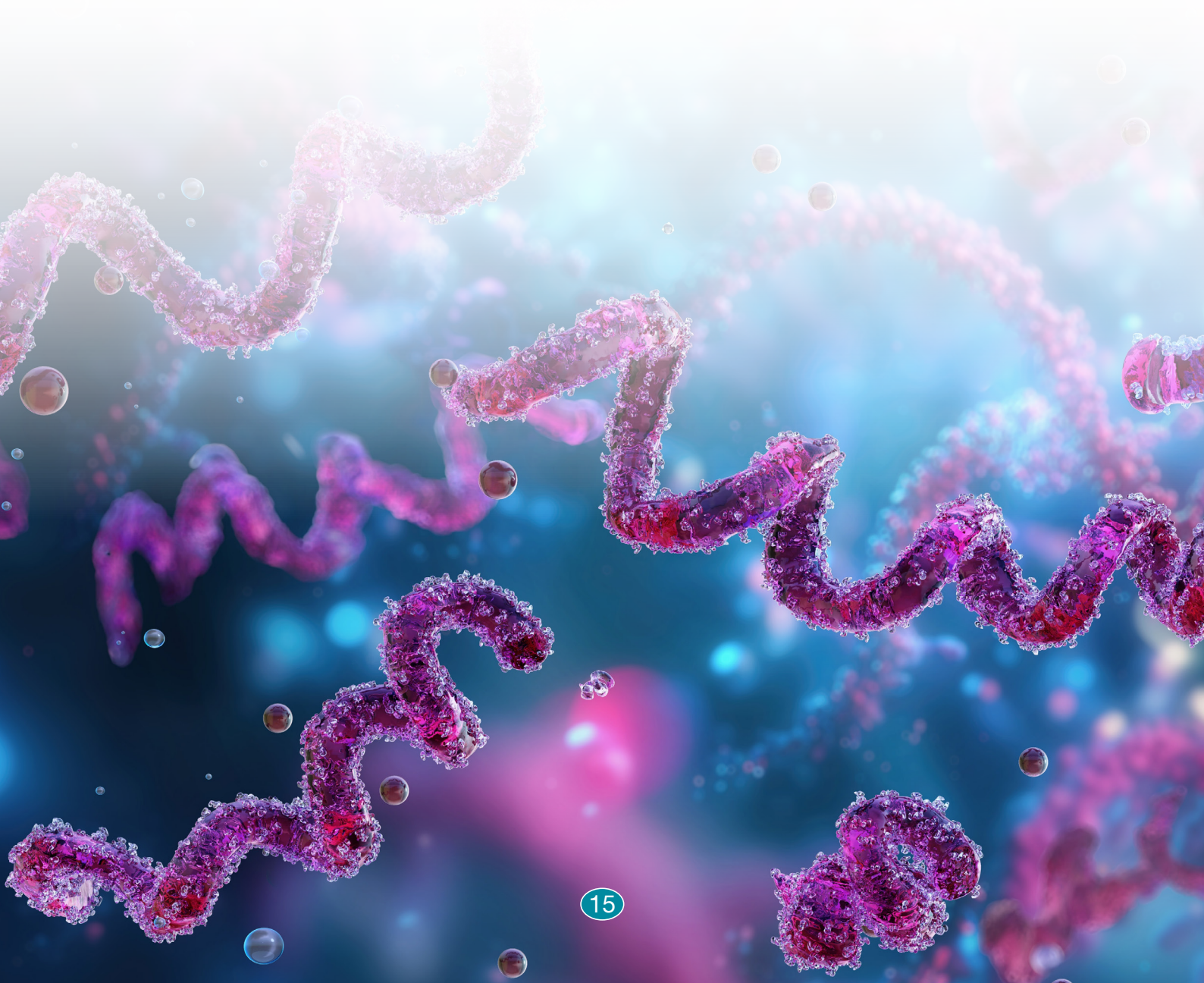
More than 30 different bacteria, viruses, and parasites are known to be transmitted through sexual contact, including vaginal, anal and oral sex. STIs have a profound impact on sexual and reproductive health worldwide, and more than 1 million curable STIs are acquired every day. In England, there were 401,800 diagnoses of STIs in 2023 alone. The 2023 annual STI report showed reductions in reported diagnoses of a number of STIs during the pandemic. This was followed, however, by increases from 2022 and 2023, with the number of people diagnosed with gonorrhoea infection rising by 7.5% (from 79,268 to 85,223), and infectious syphilis (primary, secondary and early latent stages) diagnoses rising 9.4% (from 8,693 to 9,513). The number of gonorrhoea diagnoses in 2023 was the largest reported since records began in 1918, with the number of syphilis diagnoses the largest since 1948. The incidence of STIs remains highest in those aged 15 to 24 years, amongst gay, bisexual and other men-who-have-sex-with-men (GBMSM) and some minority ethnic groups (17). Provisional data for the first half of 2024 indicates that though diagnoses decreased slightly, incidence remains high.

Since May 2022, cases of human mpox clade IIb have been reported in multiple countries that have not previously had Monkeypox virus (MPXV) in animal or human populations. Clade IIb transmission at low levels continues to be mainly among GBMSM and those who have no documented history of travel to endemic countries in Africa (18). In 2023 and 2024, there has been a total of 429 cases of mpox clade IIb reported in the UK, much lower than seen in 2022.

There are novel interventions on the horizon for STIs. In November 2023, the JCVI advised two routine STI vaccination programmes to be delivered in sexual health services: a routine mpox vaccination programme for GBMSM at higher risk of infection using the MVA-BN vaccine and a routine gonorrhoea programme using the 4CMenB vaccine for GBMSM at high risk and others outside this group but

also assessed at high risk. The mpox vaccination policy was agreed in September 2024, and the programme implementation for mpox vaccine is being supported by a UKHSA led UKHSA/DHSC/NHSE vaccine programme board.

UKHSA has worked with the British Association for Sexual Health and HIV to develop their evidence-based clinical guideline for the use of doxycycline post-exposure prophylaxis (DoxyPEP) for the prevention of syphilis. A public consultation is currently underway. In 2019 UKHSA published a Syphilis Action Plan which focuses on other key interventions such as more frequent testing for GBMSM at higher risk of syphilis, partner notification, raising awareness, and maintaining high uptake of antenatal screening for syphilis. The screening programme in pregnancy includes syphilis, HIV and HBV. In October 2024 UKHSA published its STI Prioritisation Framework, which provides an evidence-based and structured approach to local prioritisation for organisations with responsibility for planning and delivery of sexual health services. The framework shifts the focus of STI control efforts towards preventing adverse health outcomes and reducing health inequalities, recognising that STIs impact different groups in society unequally.



Gastro-intestinal infections (GI infections)

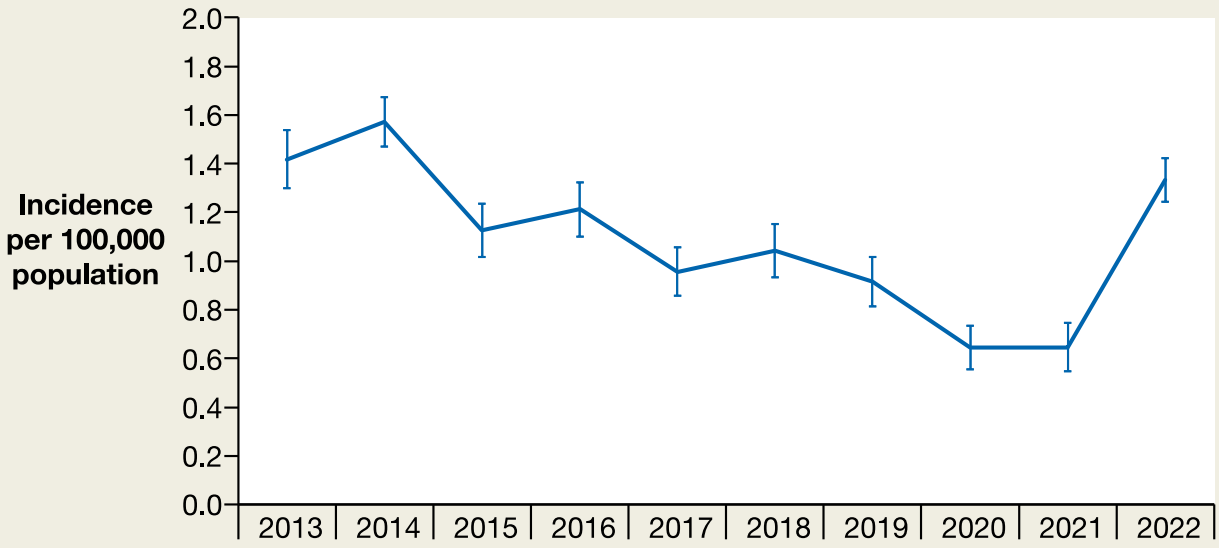
Bacterial gastroenteritis is particularly common in the summer months and outbreaks of zoonotic infections, such as campylobacteriosis, salmonellosis and Shiga toxin-producing *E. coli* (STEC) occur more often at this time. Viral gastroenteritis is more common in the winter season. Although the vast majority of infections are self-limiting, some can be serious, particularly in vulnerable groups.

During 2023, 177 Listeria cases were reported in England and Wales, a 12.7% increase in reported cases compared to the previous 5-year median. Listeriosis is a high-impact infection with the highest incidence in those over 80 years old. One sixth of infections were associated with pregnancy, of which almost a quarter resulted in still-birth or miscarriage. Seven outbreaks were detected over this period linked to consumption of smoked fish, soft cheese and beef products (19).

Similarly, STEC, whose reservoir is in ruminants, particularly cattle, can be responsible for both sporadic cases and large, nationally-distributed foodborne outbreaks. An increase in incidence has been seen following the pandemic (figure 5). One such outbreak of STEC O145 has since occurred in summer 2024, resulting in over 250 cases. The investigation linked the outbreak to consumption of multiple types of sandwiches containing contaminated salad leaves (20).

Awareness of high-risk products for vulnerable groups for both Listeria and STEC is essential, it is also vital clusters and outbreaks of these pathogens are rapidly detected and investigated so that prompt control measures can be implemented.

Figure 5: Incidence of Shiga toxin producing *Escherichia coli* (STEC) O157 culture confirmed cases by year, England, 2013-2022



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Number of cases	764	854	617	670	532	584	515	365	365	762
Cases per 100,000 population	1.42	1.57	1.13	1.21	0.96	1.04	0.91	0.65	0.65	1.33

Between 2022 and 2024 there was a notable increase in Campylobacter laboratory reports, with the rate per 100,000 population increasing by 27.0% from 96.1 in 2022 to 122.0 in 2024. During this time Salmonella laboratory reports also increased by 24.1% from a rate of 14.5 to 18.0 per 100,000 population. There are likely multiple factors driving these changes and further analyses to provide insight are underway (21).

Further data analyses will be available when the Campylobacter, Salmonella and Cryptosporidium annual reports for 2024 are published.

Finally, another virus linked to winter pressures, norovirus, has seen an earlier increase than usual in autumn 2024. Weekly data from February 2025 showed activity in winter 2024/25 at the highest levels since reporting in this way started in 2014 (Figure 6). While some of the increased reporting may be attributable to the increased use of PCR multiplex technology (capable of detecting multiple gastrointestinal pathogens in one test), it is likely that the emergence of an unusual norovirus genotype, GII.17, has driven increased incidence due to a lack of previous immunity. Simple measures such as washing your hands thoroughly with warm soapy water and staying home for at least 48 hours after recovery can help to reduce spread to others (22). The start of a new Phase-3 clinical trial for a norovirus vaccine highlights other potential future prevention strategies.

Unusual norovirus genotype, GII.17, has driven high levels this season

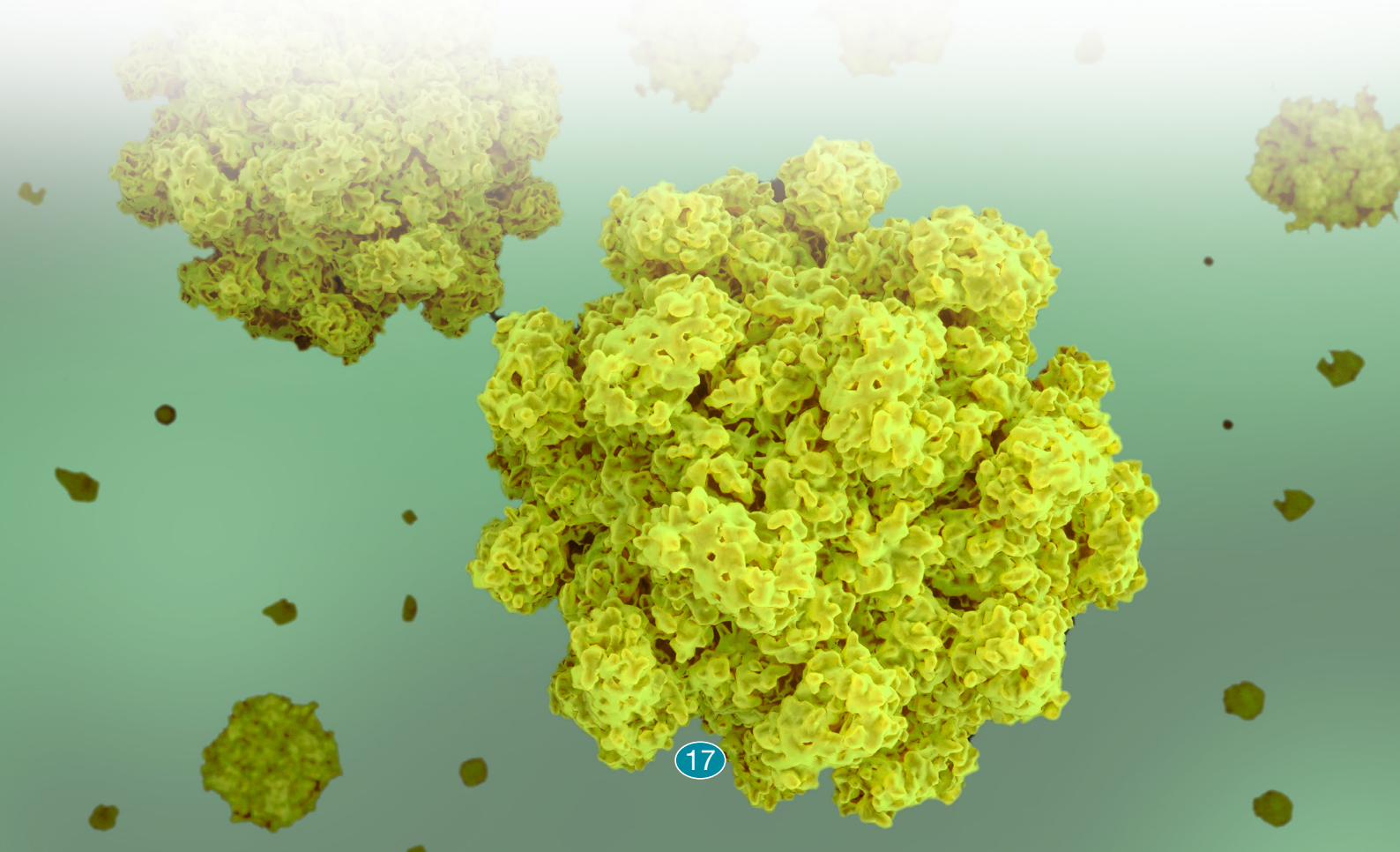
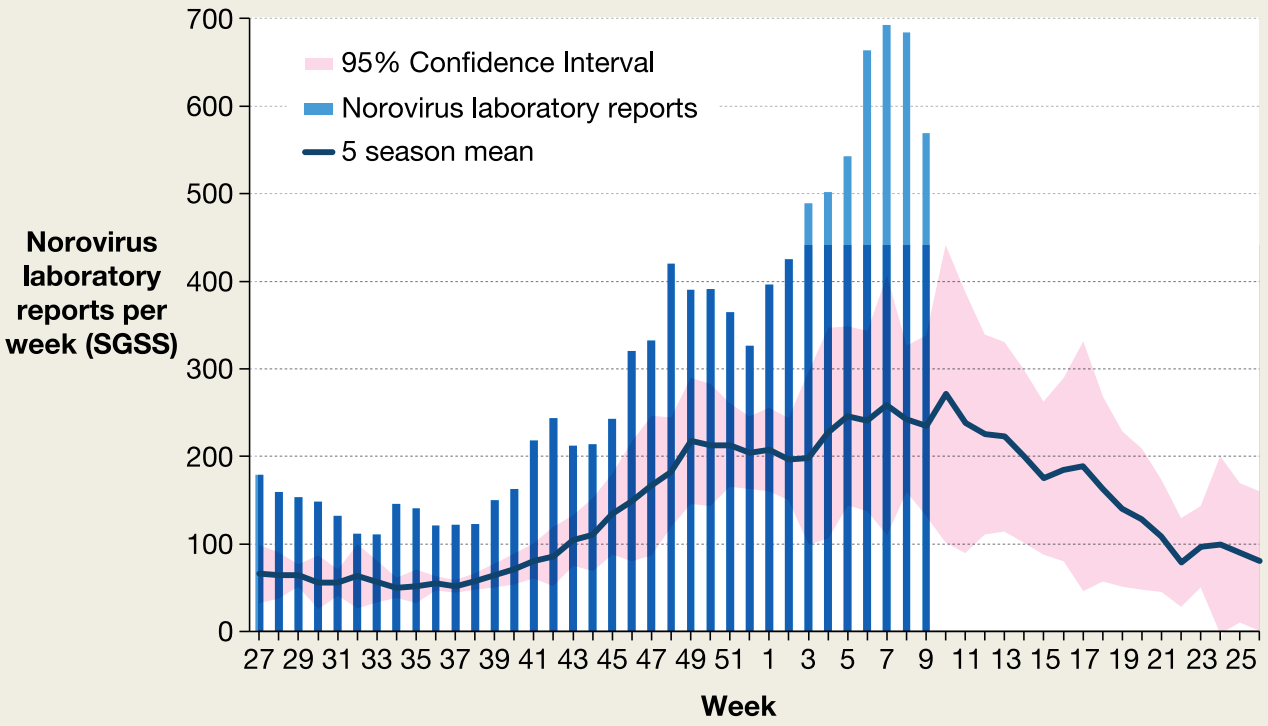


Figure 6: Norovirus laboratory reports in England by week during the 2024/2025 season, compared with previous 5 season average



Vaccine preventable infections

Vaccines are widely acknowledged as one of the most important advances in global health, allowing people to live longer and healthier lives. There are now vaccines to prevent more than 20 life-threatening diseases, including diphtheria, polio and measles.

2,911 cases of **measles** in 2024

Measles is the most infectious of all diseases transmitted through the respiratory route and symptoms can be severe, particularly in immunosuppressed individuals and young infants. We saw a resurgence of measles in 2023, with 362 laboratory confirmed cases reported in England. Early activity was concentrated in the London region, before an outbreak occurred in the West Midlands in August 2023, a region where vaccine uptake is lower amongst eligible groups. In 2024, a total of 2,911 measles cases were reported, mainly in the first 6 months of the year, with the majority of cases in children under the age

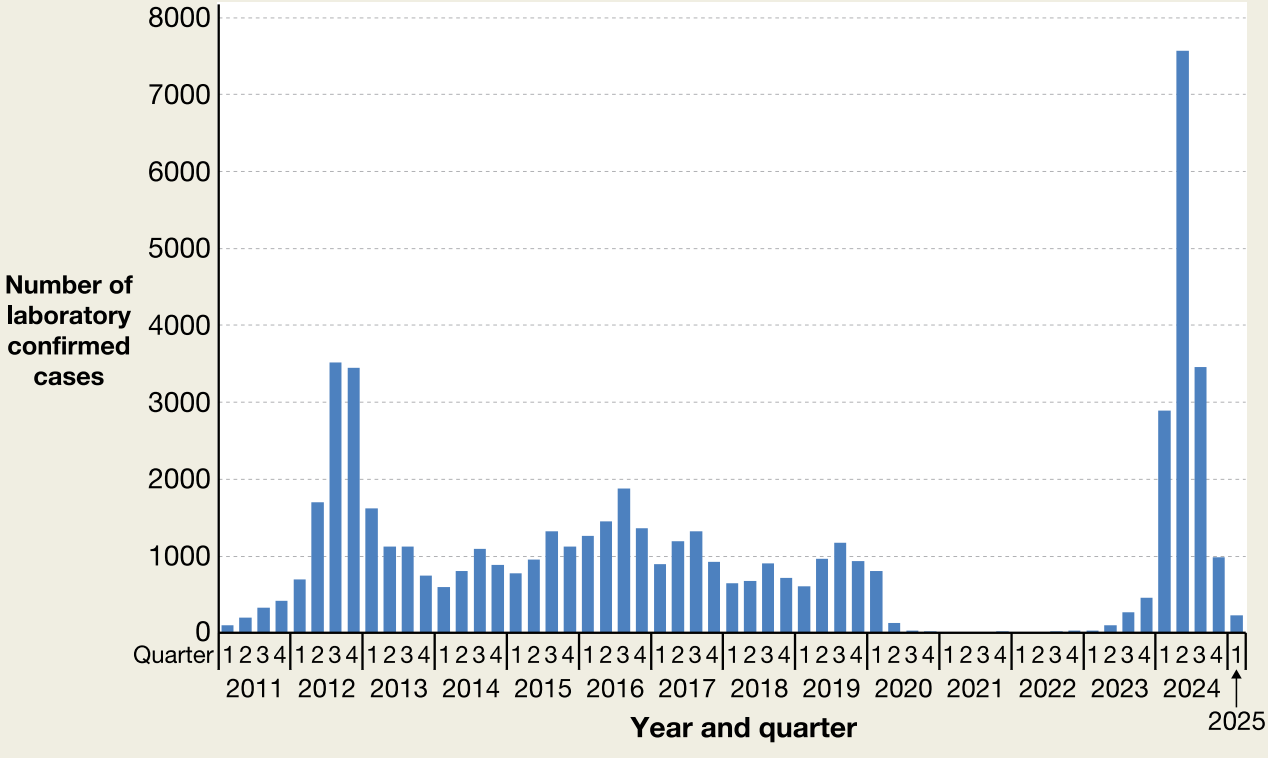
of 10 years (23). Over the last 10 years, there has been a decline in coverage of the measles, mumps and rubella (MMR) vaccine particularly in urban areas and deprived communities. An evaluation led by UKHSA showed that the national MMR catch up campaign and regional and local tailored interventions aimed at improving uptake have been successful at reaching key under vaccinated communities but more needs to be done to sustain progress and prevent further outbreaks from occurring.

Pertussis

Pertussis outbreak highlights importance of vaccination in pregnancy

Pertussis is a cyclical disease, with the last peaks before the COVID-19 pandemic occurring in 2012 and 2016. The pandemic led to exceptionally low levels of pertussis activity, followed by big rises once restrictions ended. Laboratory cases increased from 856 in 2023 to 14,905 cases (provisional data) in 2024 (24) (Figure 7). The number of cases in infants under 3 months of age, the group at highest risk of severe disease, was 433 in 2024, of whom 10 sadly died. The outbreak highlights the importance of ensuring optimal uptake of pertussis vaccine in every pregnancy, as well as in babies and children.

Figure 7: Laboratory confirmed cases of pertussis by quarter in England: 2011 to 2024



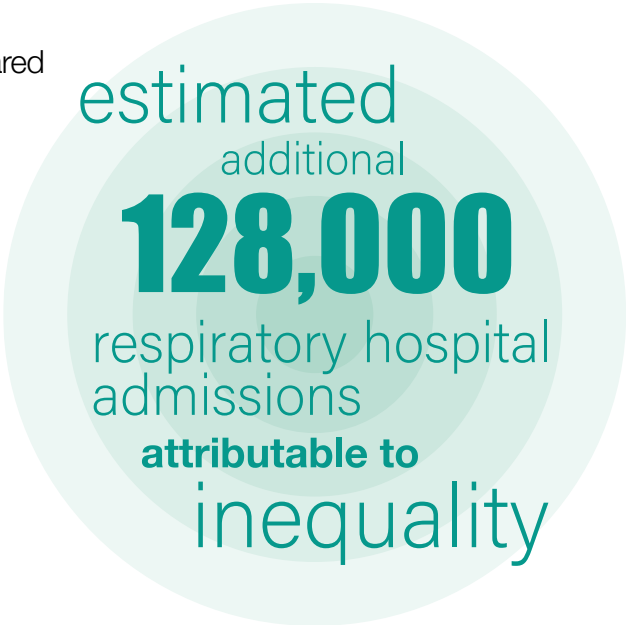
Vaccine Derived Poliovirus type 2 (VDPV2)

Finally, there have also been several detections of Vaccine Derived Poliovirus type 2 (VDPV2) in sewage samples, picked up through surveillance led by UKHSA in collaboration with the Medicines and Health Care Regulatory Agency (MHRA). The PV isolates found are genetically linked to a VDPV2 that has been widely circulating in several African countries since 2020, and linked to a cluster in Europe with detections from sewage in Germany, Spain, Poland and Finland. Whilst there is currently no evidence of community transmission, vaccine-derived poliovirus, like the ones detected, have the potential to spread, particularly in communities where vaccine uptake is lower. On rare occasions it can cause paralysis in people who are not fully vaccinated. These latest findings are a timely reminder of the importance of local areas ensuring any children not fully up to date with their polio vaccinations are caught up. (25)

Health inequalities in infectious disease and infection

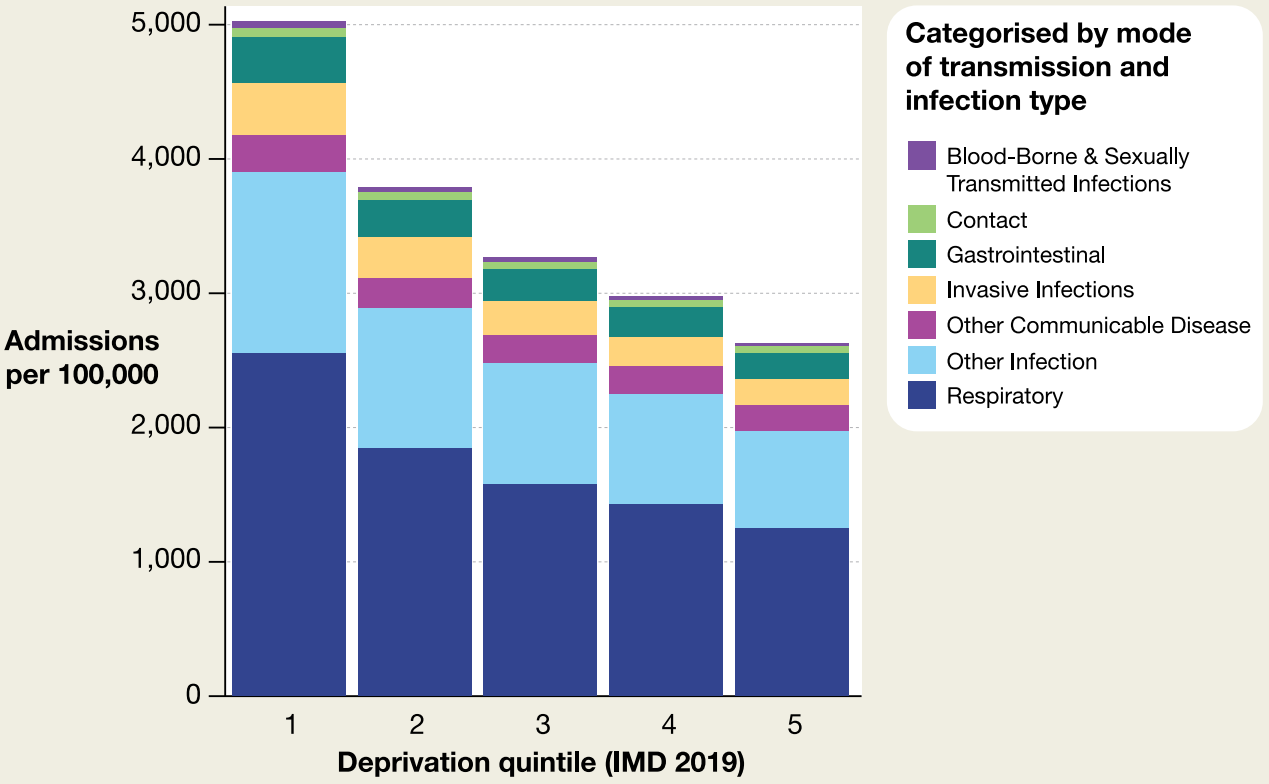
The burden of infectious disease is not distributed equally. There are persistent inequalities in health outcomes across multiple dimensions of society and for communities defined through the NHS CORE20PLUS[1] framework for instance, by age, deprivation, ethnic group, and social exclusion. For many infectious diseases, there are compounding risk factors, including inequalities in exposure, outcomes, and access to preventative measures like vaccination.

People living in more deprived areas have worse health outcomes associated with infectious disease, as compared to those from less deprived areas. In England 2023 to 2024, hospital admission rates due to infectious disease and infection were nearly twice as high for people in the 20% most deprived areas, as compared to the least deprived (Fig 8). The greatest inequality was seen in respiratory infections. There were an estimated additional 128,000 respiratory admissions attributable to inequality, for the most deprived quintile as compared to the least deprived quintile (comparing IMD quintile 1 to IMD 5) (Fig 8).



1 Definition of CORE20PLUS: NHS England » Core20PLUS5 – An approach to reducing health inequalities for children and young people

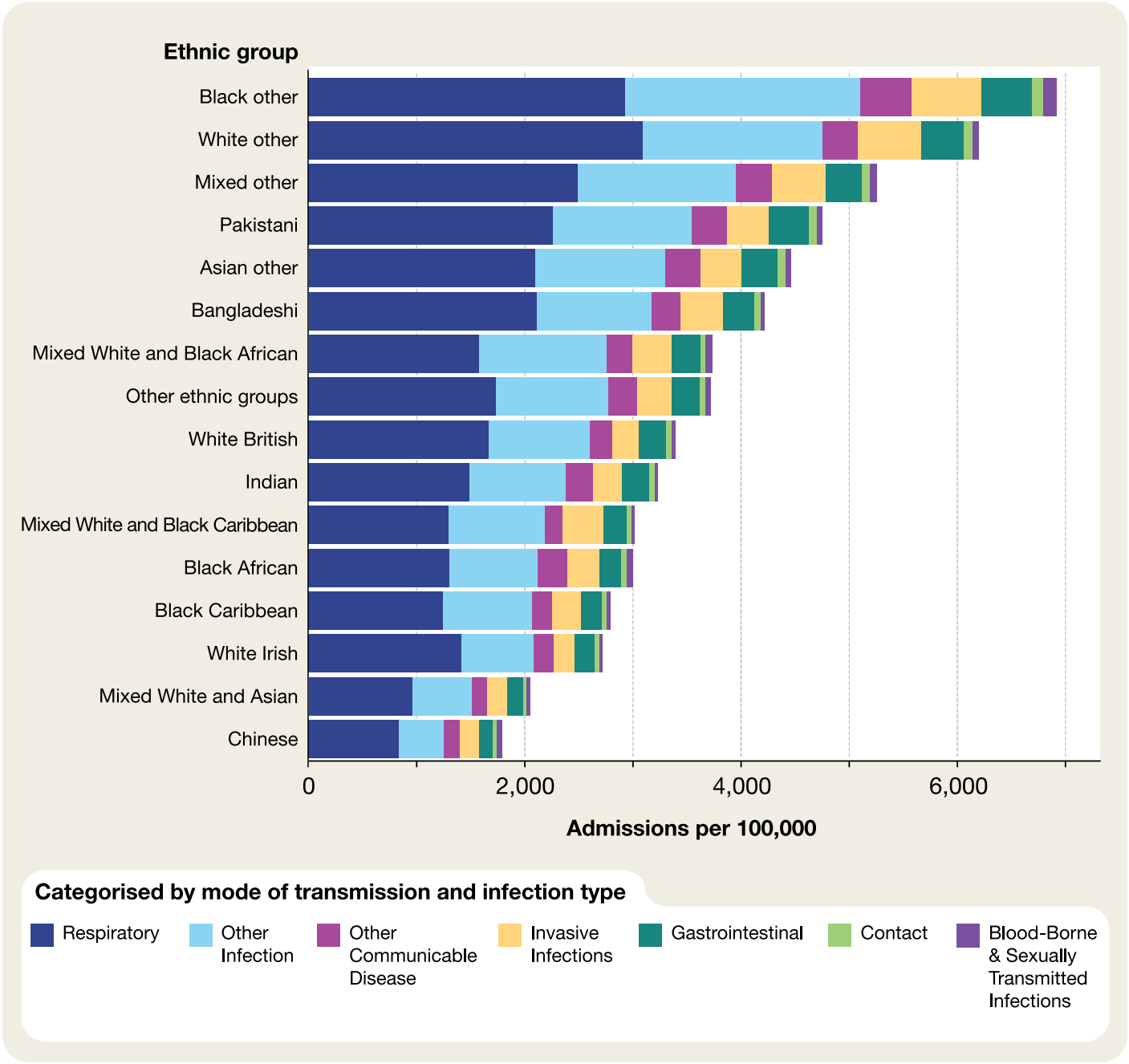
Figure 8: Infectious diseases and infections category admissions rates by deprivation level, England, 2023-2024 (age- and sex-standardised rates)



Some ethnic minority groups consistently experience worse health outcomes due to infectious disease, with the scale and pattern of inequality differing between the type of infection. In England 2023-2024, for all infectious disease admissions considered together, there were 8 ethnic groups out of 15 with admission rates associated with any infectious disease higher than the White British group[1]. Of these, 5 ethnic groups had rates that were 1.25 times higher or more, as compared to the White British group, and these differences were statistically significant. Based on guidance from the Race Disparity Unit, this size of difference is a high priority for policy action, because the admission rates are disproportionate.

1 The interpretation of rate ratios depends on their size and their statistical significance. The Race Disparity Unit provides the following guidance: Race Disparity Unit (RDU). A rate ratio of less than 0.8 or more than 1.25 would be highlighted as disproportionate. The RDU guidance recommends that rate ratios of this size that are also statistically significant are deemed high priority for policy action.

Figure 9: Infectious diseases and infections category admissions rates by ethnic group, England, 2023-2024 (age and sex-standardised rates, per 100,000)



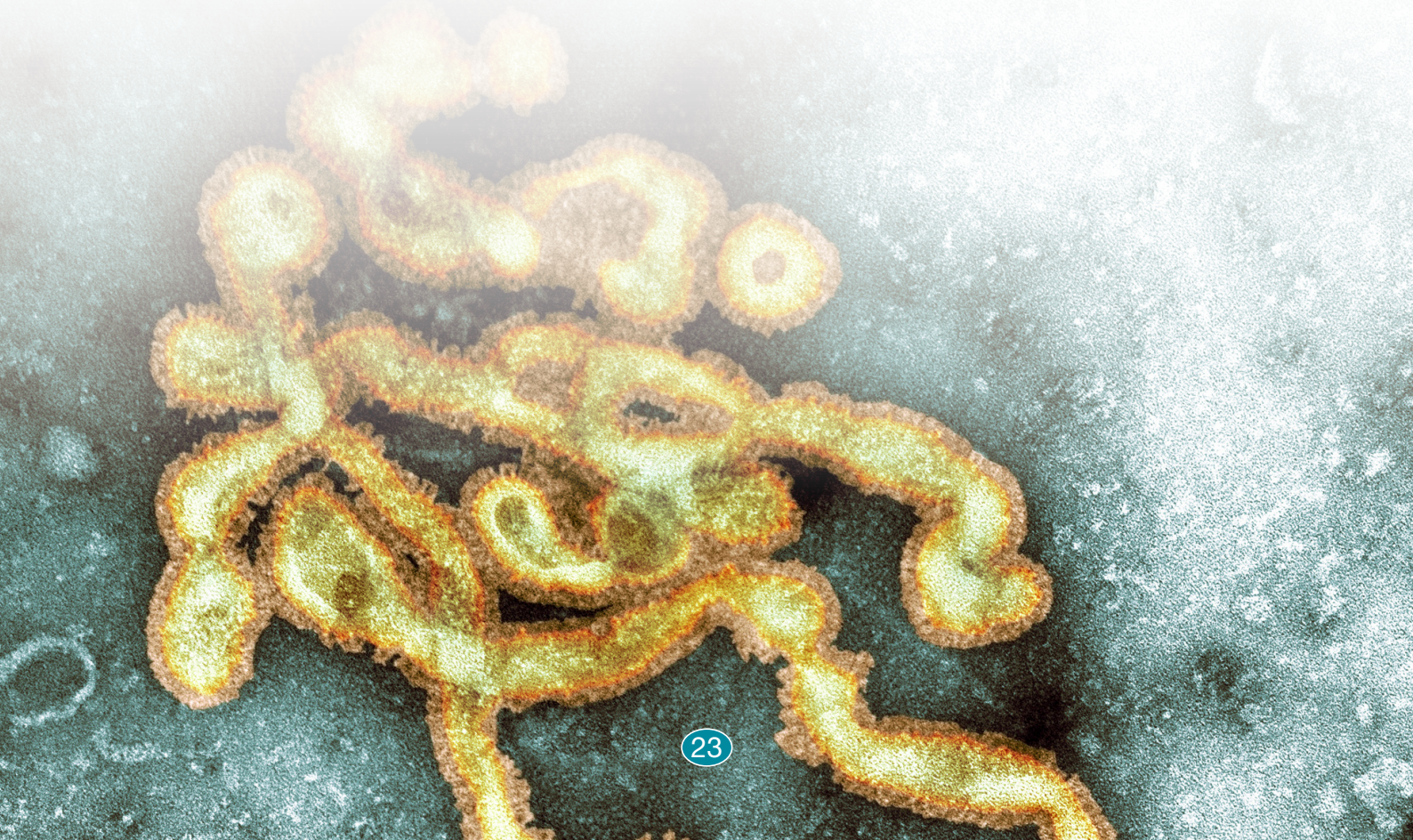
Details of methods in appendix, p29

People belonging to inclusion health[1] groups, such as people seeking asylum, people in prison, people experiencing homelessness and people who inject drugs, are also disproportionately impacted by a range of infectious diseases. In 2021, estimated TB incidence rates (per 100,000) were 50.4 in people seeking asylum entering the UK since 2018, 30.2 in people experiencing homelessness, and 28.1 in prisoners compared to 2.1 in people born in the UK (Incidence for England overall: 7.8, 2021).

People who inject drugs are at disproportionately increased risk of blood-borne viruses. Of the 62,600 adults in England estimated to be living with chronic Hepatitis C infection in 2022, 84.6% are estimated to have a current or past history of injecting drugs (15). In 2021, 18% of people who injected drugs in the past year had a chronic hepatitis C infection (26). In contrast, estimated prevalence in England overall in 2022 was 0.14%. In 2022, 72 out of the 76 (94.7%) cases of diphtheria in England were in recently arrived asylum seekers, many of whom arrived from areas of conflict where access to immunisation was poor (27).

However, inclusion health groups are not visible in most infectious disease surveillance data sources. This means that inferences about disease risk often need to be derived from published research and it is difficult to assess the overall infectious disease burden experienced. Existing data on health inequalities in the burden of infection can be used to support the targeting of interventions to improve prevention and management of infections. There is also a need for further research to understand contributing factors and design appropriate policy and practice to respond to these inequalities.

1 Inclusion health groups are people and communities who are socially excluded. This includes people experiencing homelessness, people with drug and alcohol dependence, people seeking asylum, refugees and undocumented migrants, Gypsy, Roma and Traveller communities, sex workers, people in contact with the justice system, and victims of modern slavery.



Emerging infections

A wide range of emerging infections, including zoonotic influenza and mpox clade I, remained an ongoing threat due to interactions between humans, animals and their environments. UKHSA continued to work with the Animal and Plant Agency (APHA), Department for Environment, Food and Rural Affairs (Defra) and Food Standards Agency (FSA) to monitor and reduce the risk to human health from emerging influenza viruses through early detection of cases and minimising risk of onward spread.

Swine influenza

As part of the UK's routine influenza surveillance, a case of swine influenza - A(H1N2)v virus genetically belonging in clade 1B 1.1. was detected in November 2023 (28). No onward spread was found during the public health response.

Avian influenza

Avian influenza A(H5N1) clade 2.3.4.4b has resulted in many human exposures in infected poultry holdings across the UK over the 2023/24 season. Through UKHSA's surveillance programmes, which involve sampling individuals exposed to infected birds there were a small number of detections of A(H5N1) in largely asymptomatic exposed workers, with one clinical infection in January 2025. There has yet to be demonstrated human-to-human transmission of avian flu despite extensive recent surveillance. UKHSA's work in this area forms a critical part of the UK's broader respiratory epidemic and pandemic preparedness activities.

In Spring 2024, the US reported the detection of A(H5N1) in dairy cattle, which has affected herds across several US states, but also involved poultry, wild birds and other mammals in North America. There have been a number of symptomatic human cases reported ranging in clinical presentation from mild to severe – largely amongst those exposed to infected animals. The UK has been undertaking regular situational assessments as part of contingency planning (29).

Mpox

In August 2024, WHO declared mpox clade I a Public Health Emergency of International Concern (PHEIC) under the International Health Regulations. This followed the identification and rapid spread of clade Ib in the Eastern Democratic Republic of Congo together with some neighbouring countries. Ten cases of clade Ib have been reported in the UK to date. Seven cases had recent travel links to affected countries in the African region; one of which led to onward transmission to three household contacts in the UK (30), but no further spread. This outbreak continues to evolve and will lead to further exports outside of the African region.

Other emerging infections

A wide range of other emerging infections have been detected, assessed and managed. These range from *Brucella canis* (31) where a small number of human cases have been diagnosed linked to recently imported dogs to a variety of vector borne diseases such as five cases of locally acquired Tick-Borne encephalitis since 2019 (32), detected as part of monitoring rapidly shifting patterns of vector epidemiology across Europe.

Economic benefits of health protection interventions

UKHSA undertook to determine the economic benefits of various health protection and health security activities relevant to its remit. A literature review was conducted to look at benefit cost-ratios (BCR), returns on investment and other economic assessment studies of any intervention targeting infections and infectious diseases, also, chemical, biological, radiological and nuclear threats across a range of capabilities (including prevention, vaccination and surveillance). The literature search identified over 13,500 articles, which were screened on abstract and sifted down to 486 for full text review. This review also made novel use of Artificial Intelligence (AI), by using a Large Language Model (LLM) to help label articles speeding the review process and prioritising relevant and UK-based evidence. The literature review resulted in the inclusion of 117 papers covering a wide range of diseases and types of interventions such as case finding, diagnostics, infection control and vaccination.

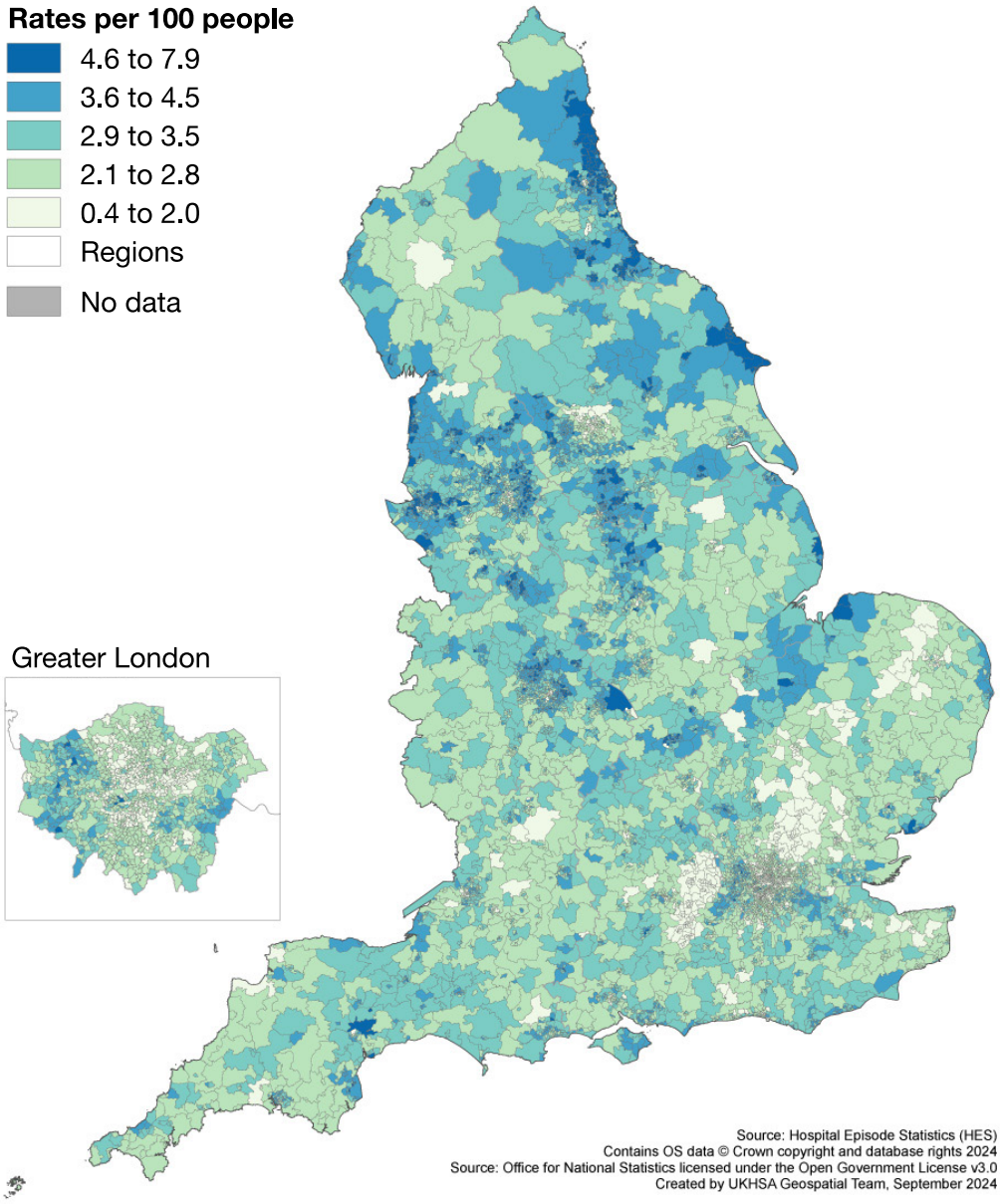
The results of the review were also used in the calculation of an illustrative whole-of-agency benefit cost-ratio (BCR). Summary economic outcomes from identified papers were averaged for specific UKHSA capabilities and then weighted by those capabilities' funding to produce an overall estimate of UKHSA activities' BCR of 7.2 or £7.20 of benefit for every £1 spent. This was based on conservative assumptions used for evidence synthesis or where evidence was lacking. Sensitivity analysis suggested higher ratios were consistent with the activities of the agency with a range of 4.9-21.1 generated.

In addition to this work, UKHSA catalogued ICD-10 codes related to infections and infectious diseases enabling an assessment of their burden on NHS hospitals (admitted care) in England using routine health data. This found that over 20% of secondary care bed days in 2023-24 were attributable to infectious disease or infections, at a cost to the NHS of £5.9 billion[1,2]. The work has also been helpful for several other projects conducted by others across UKHSA, including mapping diseases that exert significant pressures on general acute and critical care beds (Fig 10).

1 Does not include wider costs to the NHS such as associated GP care or wider economic costs

2 This is compared to an estimated c£38bn total spent on inpatient care

Figure 10: Hospital admission rates for infectious diseases per 100 people by MSOAs, England 2023



Conclusion

The COVID-19 pandemic not only disrupted the epidemiology of a wide range of infectious diseases but also their associated surveillance, control and prevention programmes. This report highlights the ongoing impact of the pandemic, but also shows that some infectious diseases are starting to return to more expected patterns and levels of transmission. Some of the interventions deployed during the pandemic are providing opportunities to review and strengthen our current health protection measures, which will be critical as the threat from a wide range of infections with epidemic and pandemic potential continues to evolve.

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Appendix

Methodology, definitions and supplementary data for metrics on health inequalities

Infectious disease and infection admissions

Hospital admissions for infectious disease and infections were identified using the Secondary Uses Services Admitted Patient Care (SUS APC) for the year 1 September 2023 – 31 August 2024. They were defined as hospital admissions due to infectious disease or infection based on the primary or secondary diagnosis (ICD-10 codes in 1st or 2nd position only). Admissions were filtered to one episode per patient. The analysis focuses on infectious diseases and infections and includes some non-communicable diseases that occur due to infection, where there is published evidence that infections are its primary aetiological factor (PAF), i.e., PAF > 60%.

Ethnic group

Individual ethnic group data is based on records from the General Practice Extraction Service (GPES) Data for Pandemic Planning and Research (GDPPR), supplemented by ethnicity data recorded in the Hospital Episode Statistics (HES) data sets. The NHS Digital HES ethnicity method is used for assigning ethnic group. We use the most detailed level of ethnic group data available in HES, which includes the 16 ethnic groups, under 5 main categories, in line with the NHS Data Dictionary for ethnic groups. The White British ethnic group is used as the reference group for comparisons because this group represents the largest population in England. The largest group is used because it has the most stable rate and therefore the comparison will be subject to less fluctuation. Population sizes per ethnic group were from ONS Census 2021 data.

Details of methods for figures 8 and 9.

For figure 8, admitted Patient Care September 2023 – August 2024, visualisation: UKHSA, analysis: We focus on the 20% most deprived to align with the CORE20PLUS framework.

ICD-10 code categorisation method, rate ratios, and confidence intervals in supplementary data tables.

For figure 9: Admitted Patient Care September 2023 – August 2024, visualisation: UKHSA, analysis: All ethnic groups with an admission rate <0.8 or >1.25 times that of the White British group have 95% confidence intervals within the threshold.

Notes: across all ethnic groups, we have not accounted for differences between non-UK born and UK-born individuals.

ICD-10 code categorisation method, rate ratios, and confidence intervals in supplementary data tables.

Deprivation

The Index of Multiple Deprivation (IMD) is the official measure of relative deprivation in England produced by the Ministry of Housing, Communities and Local Government (MHCLG). It describes the relative level of deprivation in a small area (lower layer super output area - LSOA), but not necessarily the individual people living in the area. Many non-deprived people live in deprived areas and many deprived people live in non-deprived areas. Areas are ordered by IMD score and grouped into 5 categories (IMD quintiles). IMD 1 refers to the most deprived areas and IMD 5 refers to the least deprived areas. Deprivation level was assigned to each hospital admission based on the area where the patient lived, using their home postcode at the date of admission. The least deprived group (IMD 5) is used as the reference group throughout.

Age and sex

Individual age is based on age at time of hospital admission, using date of birth. We use 5 age bands; 0-4 years, 4-14 years, 15-44 years, 45-64 years, 65+ years. Sex is recorded as either male or female.

Region

An individual's region is based on their postcode, from APC. Regions are categorised using the 7 English NHS regions based on individual's postcodes.

Admission rate ratios and rate differences

We calculated age-and sex-standardised admission rates, rate ratios and rate differences for deprivation quintiles, ethnic groups and regions. Admission rates were calculated per 100,000 of the population.

Rate ratios and odds ratios were considered disproportionate if they (and +/- 95% confidence intervals on the estimate) are >1.25 or <0.80. This follows the Race Disparity Unit's guidance on disproportionality.

Admissions attributable to inequality are calculated using the following formulae:

$$\text{Attributable fraction} = \frac{\text{admission rate difference}}{\text{admission rate in inequality group}}$$

Attributable events = attributable fraction ×number of admissions in inequality group

ICD-10 codes and categories

A list of ICD-10 codes for all infections and infectious diseases was created by UKHSA through consolidated literature search, manual code review, and validation by subject matter experts. Inclusion criteria for the list of ICD-10 codes is presented in the table below:

Inclusion	• an infection is caused by any pathogen entering the body – this includes bacteria, fungi, protozoa, worms, viruses and prions • the condition is an infection • the condition is not an infection but there is published evidence that infections are its primary aetiological factor (i.e., that the primary aetiological factor (PAF) >60%)
Exclusion	• the condition is sometimes caused by an infection, but infections are not the primary aetiological factor (i.e., PAF <60%) • the condition can result in an infection but is neither an infection nor caused by one (e.g., diabetes)

Disease categories are based on primary mode of transmission, with sorting of individual ICD-10 codes informed by ICD-10 chapters, the World Health Organization category of communicable diseases, and subject matter expert and clinician input at ICD-10 code level.

Categorisation enables analysis of admission rates across different types of disease, to see how inequalities differ across modes of transmission:

- **Respiratory**: infections and infectious diseases with respiratory transmission, including influenza, COVID-19, and tuberculosis
- **Gastrointestinal**: infections and infectious diseases with GI transmission, for instance, norovirus
- **Touch and contact**: infections and infectious diseases primarily spread through touch or close contact, including mpox and streptococci and staphylococci infections
- **Sexually transmitted infections and blood-borne viruses**: all infections with primarily sexually transmitted pathogens, hepatitis B and C, HIV, and resulting complications
- **Invasive infections**: infections in a sterile site that do not fall into one of the above categories, such as some forms of sepsis and lymphadenitis
- **Other communicable diseases**: communicable diseases that do not fall into one of the above categories, such as vector-borne.
- **Other infections**: infections within UKHSA's remit that don't fall into one of the above categories, for instance, surgical site infections
- Diseases in each category are detailed below and have been reviewed by subject matter experts. Not all diseases listed in are present in the admissions data.

Caveats: Many conditions have multiple modes of transmission, the groupings are based on primary mode of transmission. Some conditions are considered vaccine preventable diseases, these are distributed between the categories depending on their primary mode of transmission.

About the UK Health Security Agency

UK Health Security Agency (UKHSA) prevents, prepares for and responds to infectious diseases and environmental, radiological and chemical hazards, to keep all our communities safe, save lives and protect livelihoods.

We provide scientific and operational leadership, working with local, national and international partners to protect the public's health and build the nation's health security capability.

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