UK Health Security Agency

# Appendix 3. Supporting information

October 2024

# Contents

# Introduction

Sexually transmitted infections (STIs) are a major public health concern which can seriously impact people's health and wellbeing and constitute a substantial cost to healthcare services. If left undiagnosed and untreated, STIs can cause severe complications and long-term health problems. Gonorrhoea and syphilis have reached historically high levels following rising trends for over a decade, with tens of thousands of diagnoses made every year.

The burden of sexual ill health falls disproportionately on certain populations. The diagnosis rates of common STIs remains greatest in gay, bisexual and other men who have sex with men (GBMSM), young people aged 15 to 24 years, some ethnic minority groups and people residing in the most deprived areas in England. There have been increases in antimicrobial resistance (AMR) in gonorrhoea, the re-emergence of sexually transmissible enteric infections such as *Shigella* spp. and an increase in congenital syphilis cases over the past 10 years.

The COVID-19 pandemic disrupted sexual health service (SHS) provision. Testing for and diagnoses of human immunodeficiency virus (HIV) and STIs fell during 2020 and although some recovery was observed with increased access to online testing, uptake remained below pre-pandemic levels until November 2021. Services which could not be provided remotely, such as vaccination and diagnoses of STIs that require visual examination, were more affected. The long-term and indirect impacts of the pandemic response on sexual health outcomes will take time to emerge and evaluate.

The management of both acute and recurrent STI symptoms and persistent complications incurs a substantial immediate, and potentially long-term, emotional and physical burden to the individual, in addition to a financial cost to the health system. Prevention is central to achieving good sexual health in the population by reducing the risk of acquiring infection and of potential longer term health harms. Several prevention activities and interventions need to be considered when developing a comprehensive response to sexual health needs in a community. Given the disparity in the burden of STIs, it is important that culturally competent interventions are tailored to communities with greater sexual health needs.

This document provides supporting information and links to references and resources to accompany the UK Health Security Agency (UKHSA) STI Prioritisation Framework, 2024.

# 1. Epidemiology

## Scale of the problem

STIs are caused by bacterial, viral and protozoal pathogens, and sometimes fungi and parasites, all of which present unique challenges for prevention, treatment and management. While most commonly transmitted through sexual contact, some STIs can also be transmitted vertically during pregnancy or childbirth.

The experience of STIs varies from asymptomatic, self-limiting bacterial infections, to lifelong viral infections with recurrent episodes. For many infections, if left undiagnosed and untreated, a proportion of those affected will develop a range of severe complications and long-term health problems, including chronic pelvic pain, ectopic pregnancy, infertility, neurological complications, and cancers of the cervix and anus, as well as foetal and neonatal death.

In 2013, the Department of Health and Social Care (DHSC) set out an ambition in their document A Framework for Sexual Health Improvement in England to reduce rates of STIs among people of all ages amid rapidly increasing diagnoses of STIs. However, aside from the major decline in genital warts because of human papillomavirus (HPV) vaccination, most other STIs overall have increased in the intervening period, bacterial STIs (gonorrhoea, syphilis and chlamydia) in particular. The COVID-19 pandemic led to a temporary decline caused by disruptions to services, affecting testing and diagnoses, and reduced transmission due to restricted social and sexual mixing. However, some STIs returned to and exceeded pre-pandemic levels in the months following the final lifting of COVID-19 control measures.

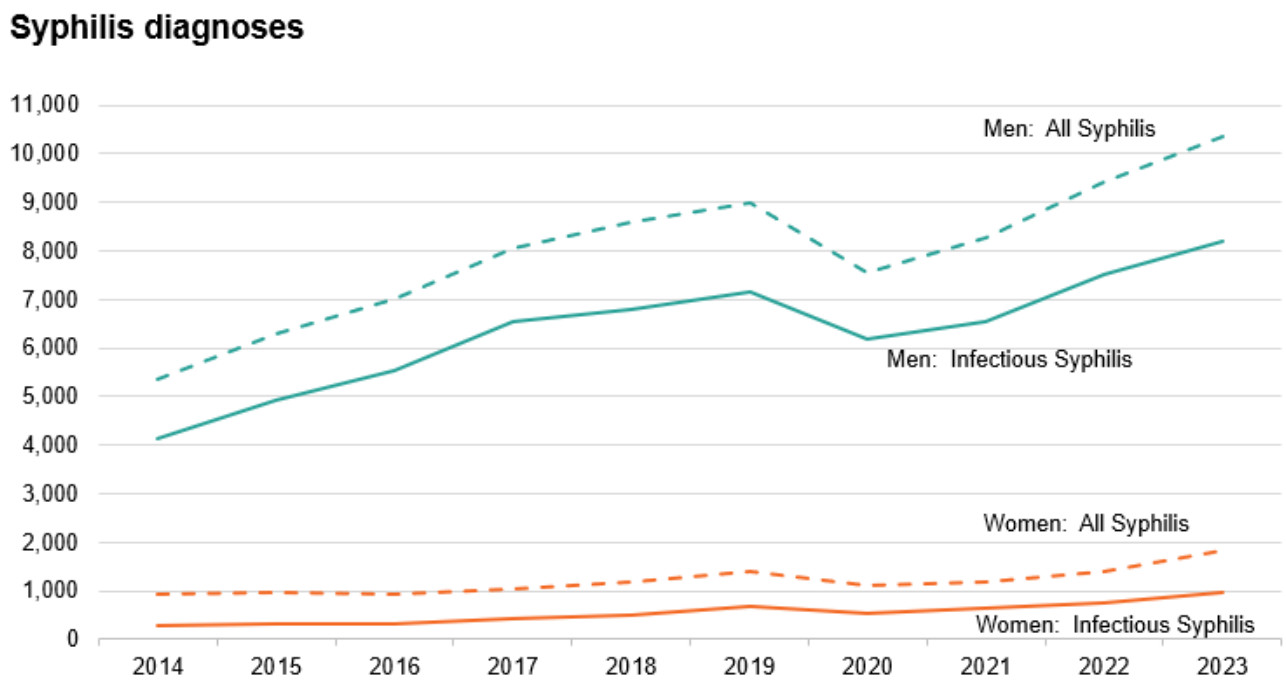
In 2023, 401,800 new STI diagnoses were made at SHSs in England (1).

Among new STI diagnoses reported in 2023 the most common were:

- chlamydia (49%)
- gonorrhoea (21%)
- first episode genital warts (7%)
- first episode genital herpes (7%)

Figure 1 presents 4 trend graphs from 2014 to 2023 with the number of diagnoses per annum for syphilis (Figure 1a), gonorrhoea (Figure 1b), genital herpes (Figure 1c) and genital warts (Figure 1d) in England.

**Figure 1a. Number of diagnoses per annum for syphilis [note 1] in England 2014 to 2023**




Note 1: The syphilis solid line in the above graph represents infectious syphilis (primary, secondary and early latent) the dashed line shows all syphilis: infectious syphilis plus new diagnoses of late latent syphilis (longer standing infections, with no symptoms, which are not infectious but can cause harm in those infected and requiring treatment).

**Figure 1b. Number of diagnoses per annum for gonorrhoea in England 2014 to 2023**

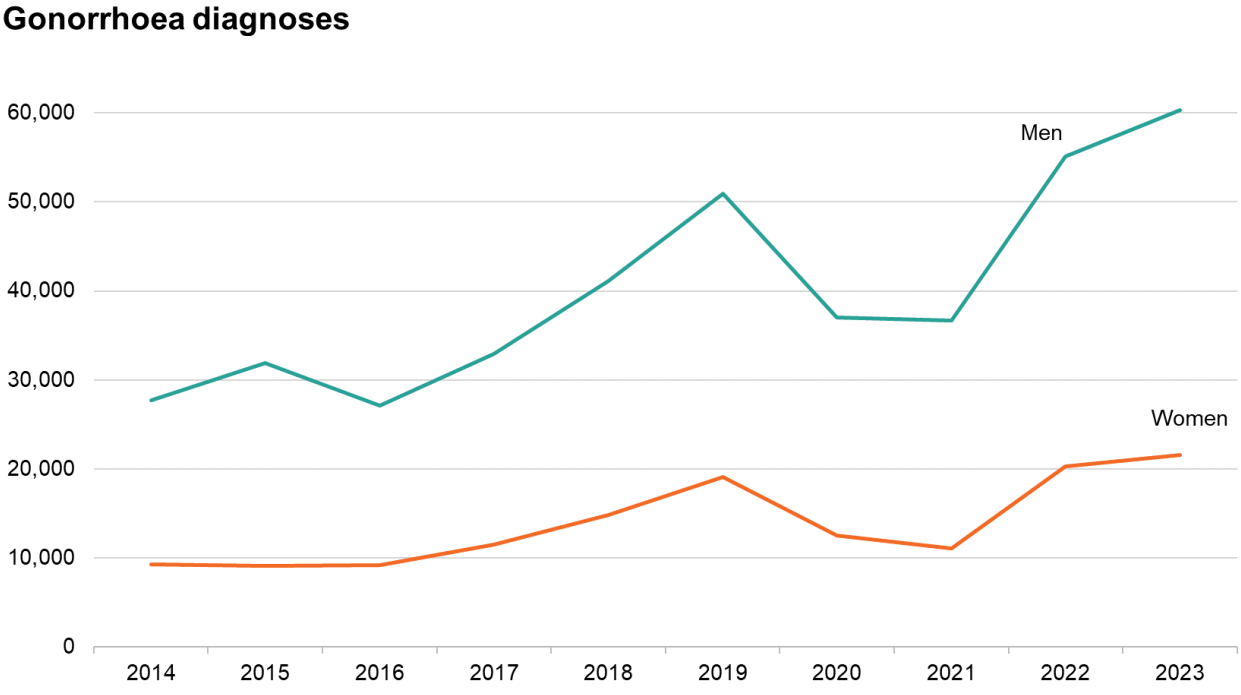


**Figure 1c. Number of diagnoses per annum for genital herpes in England 2014 to 2023**

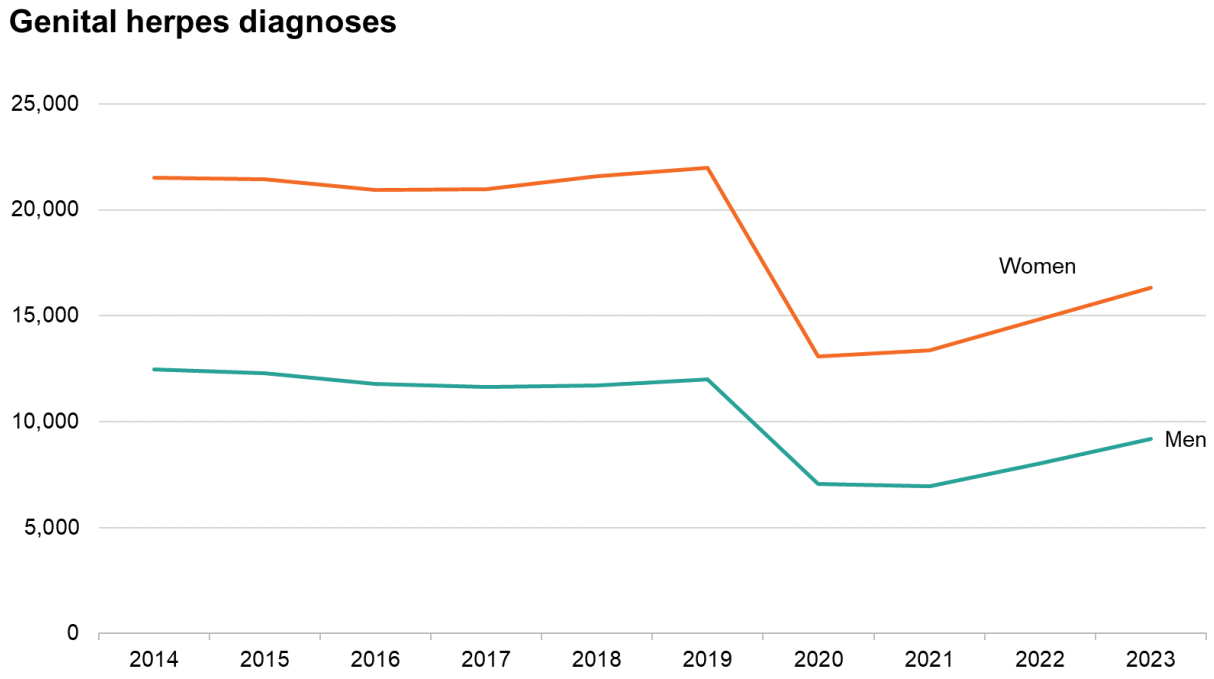
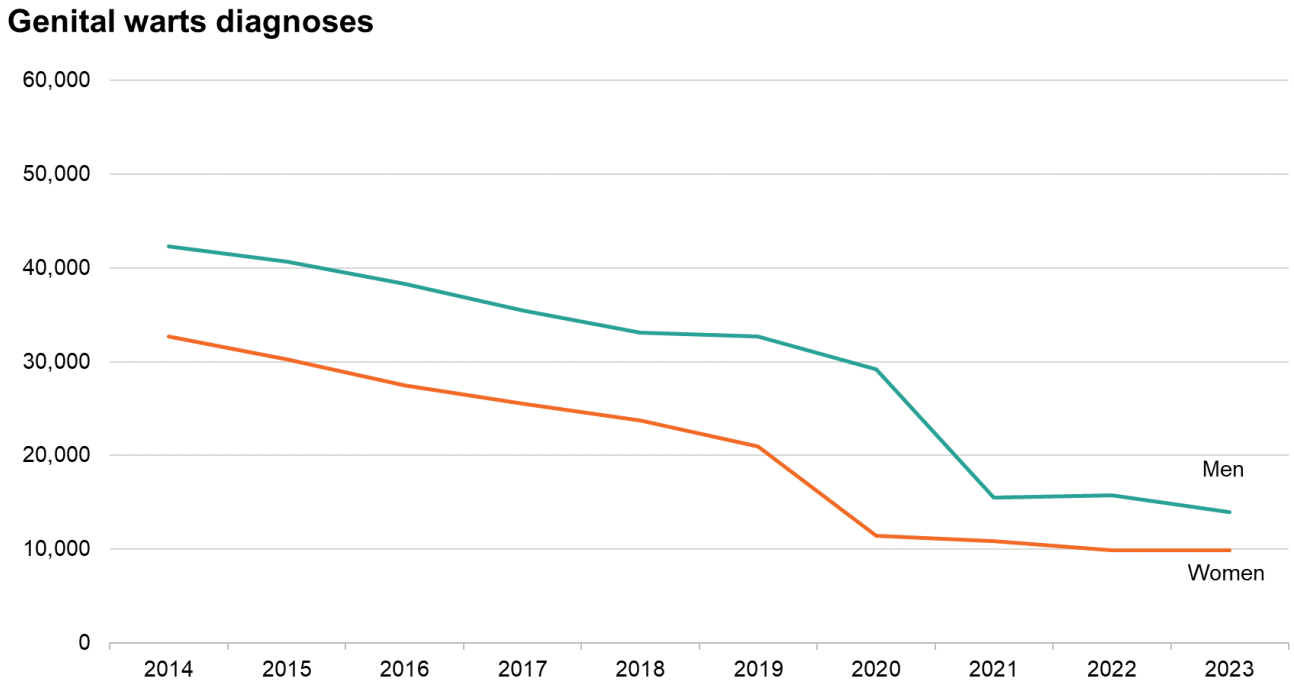



**Figure 1d. Number of diagnoses per annum for genital warts in England 2014 to 2023**




Source: Data from routine returns to the GUMCAD STI Surveillance System (Table 1 of the STIs annual data tables).

The number of gonorrhoea diagnoses in 2023 was the largest reported since records began in 1918 (Figure 2a). Gonorrhoea diagnoses have fluctuated considerably over this period, but there has been an overall increasing trend since 2010. Syphilis is following a similar trajectory, with diagnoses in 2023 at their highest since the 1940s (Figure 2b). Although there has been an increased rate of STI testing over this period, the rate of increased diagnosis of STIs has been steeper, suggesting that increased transmission of STIs is playing a role in this rise.

**Figure 2a. Long-term trends in gonorrhoea diagnoses, England 1918 to 2023 [note 2]**

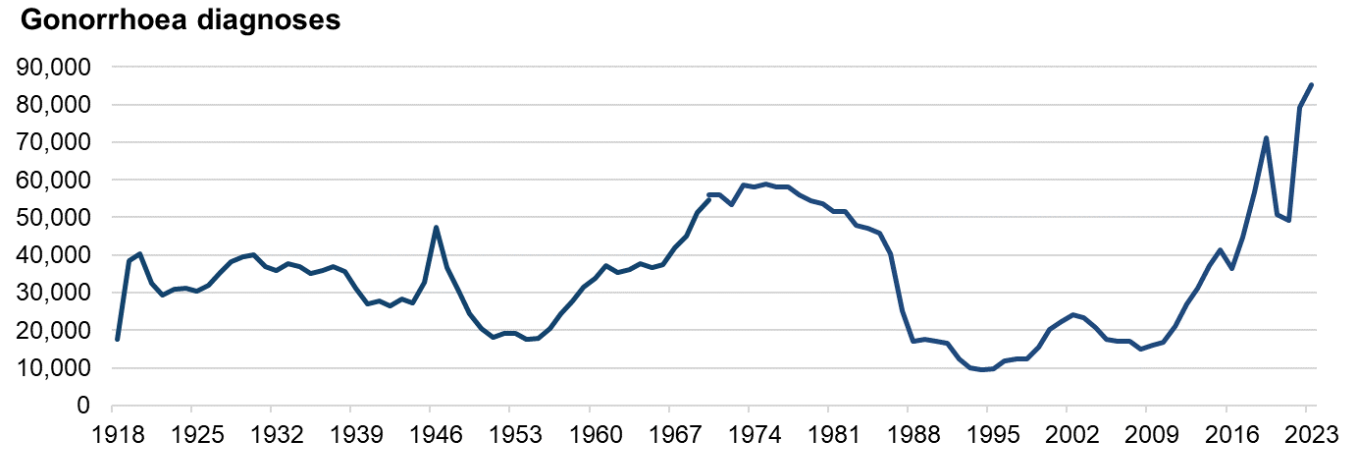
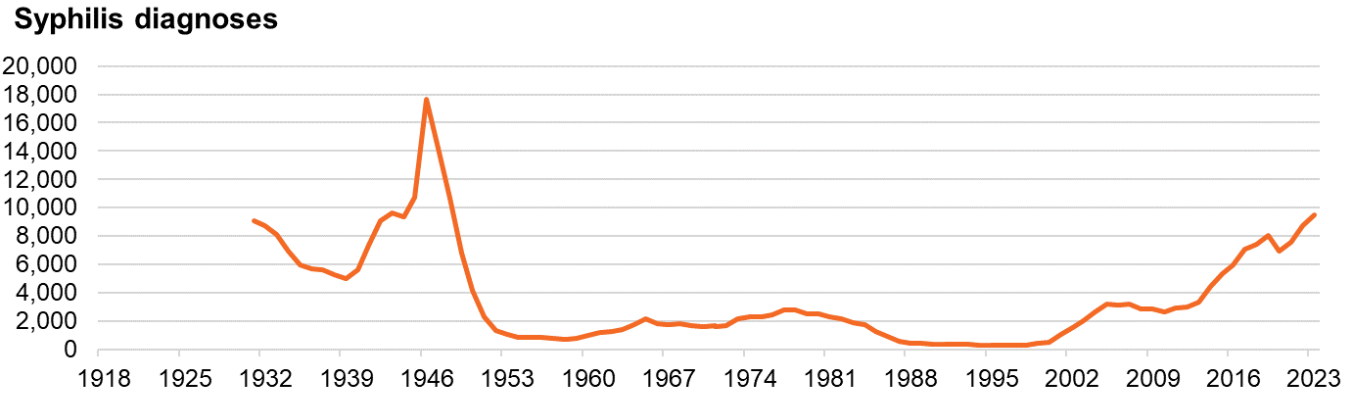



**Figure 2b. Long-term trends in syphilis diagnoses, England 1918 to 2023 [note 2]**




Source: Sexual Health Surveillance, England (includes GUMCAD data from 2009 to 2023).

Note 2: Interpretive note on the graphs: population, societal and healthcare changes have occurred over the timespan (1918 to 2023) covered by these graphs. The overall population has increased by more than 25 million and is on average older and more urbanised. Factors that influence the epidemiology of STIs include:

- periods of significant upheaval and mass movement during 2 world wars
- the advent of the antibiotic era, particularly penicillin introduction in 1948, followed soon after by antibiotic resistance in gonorrhoea
- changes in societal attitudes to sex, sexual orientation and gender identity; women's liberation movement and decriminalisation of same sex sexual activity

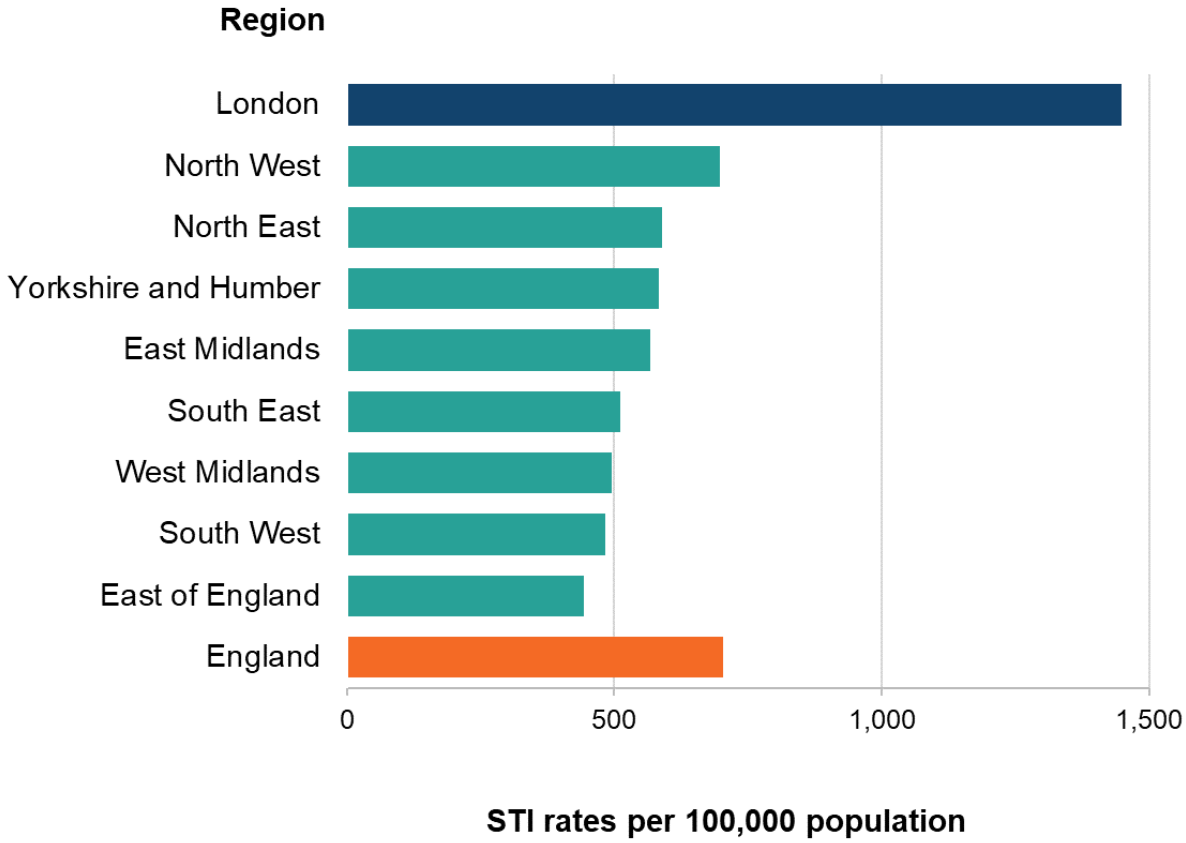
- availability and more widespread use of non-barrier contraception ‘the Pill’ since the 1960s and latterly methods of long-acting reversible contraception
- the emergence of acquired immune deficiency syndrome (AIDS) and the HIV pandemic in the early 1980s; the advent of effective HIV antiretroviral treatment from the mid-1990s
- invention of the internet leading to new ways to meet and arrange social and sexual contacts using social media and apps
- wider access to and recommendations for STI testing; as well as the use of more sensitive diagnostic methods with improved detection of asymptomatic infections and which work well with self-taken samples, increasing their reach

# Data on STIs in England

Annual data showing national, regional and local trends in STI diagnoses at SHSs are published as Official Statistics by the UKHSA using data tables as well as updates to the Sexual and Reproductive Health Profiles. The data tables and reports provide numbers and rates of diagnoses by gender identity, age, ethnic group, sexual orientation and geographical distribution. A brief description of STI surveillance systems is at the end of this document. A guide to local and national data is available to help understand the sexual and reproductive health data available across England and how the data can be accessed.

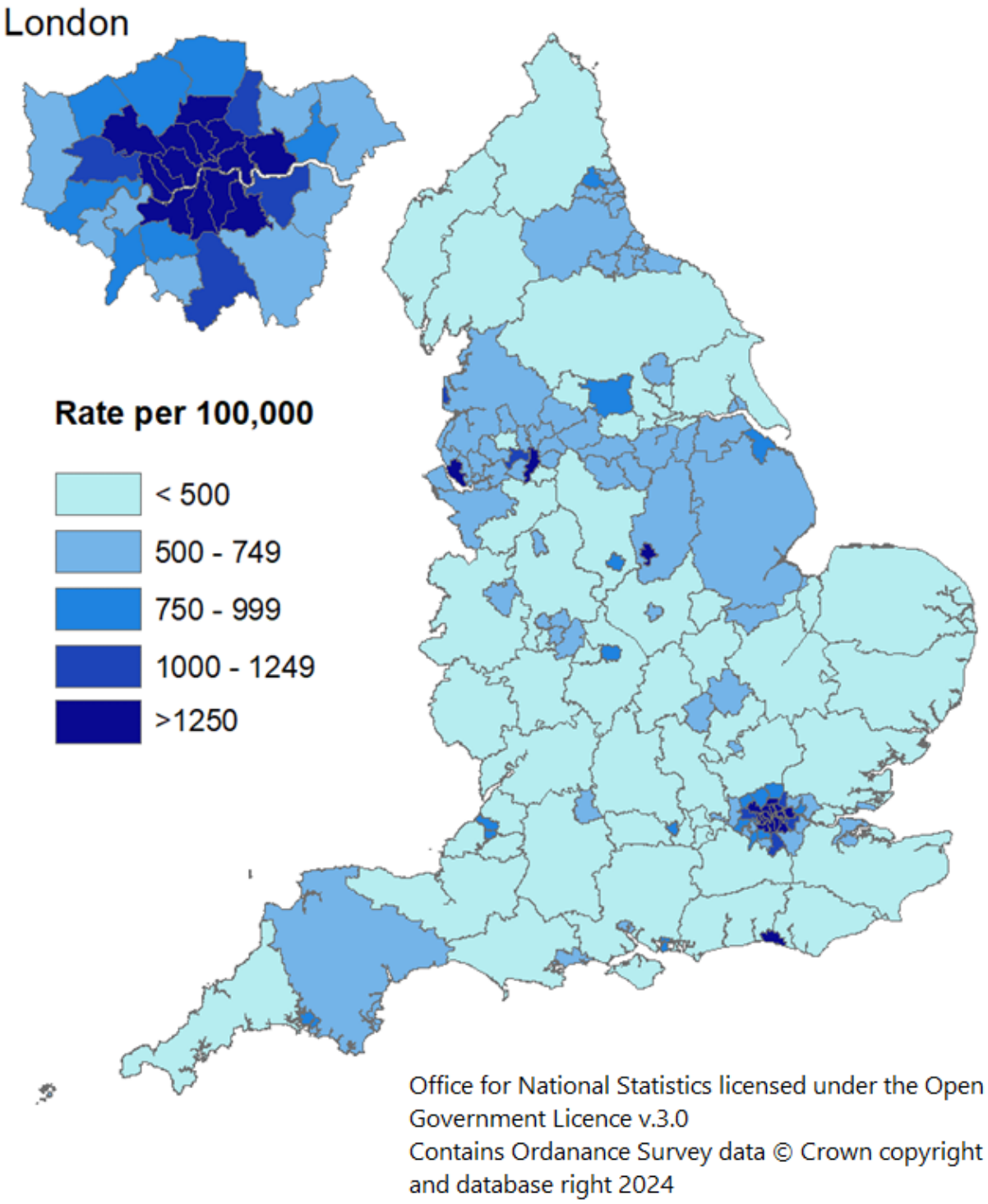
Figure 3 and Figure 4 show the substantial inter- and intra-regional variation in STIs within England. Rates are highest among residents of urban areas, particularly in London where the rate (1,448 per 100,000 population) was more than 2 times higher than for any other region in England.

**Figure 3. New STI diagnoses rates per 100,000 population by region, England 2023**




Source: Data extracted from Sexual and Reproductive Health Profiles.

**Figure 4. Map of all new STI diagnoses rates per 100,000 population by upper tier local authority (counties and unitary authorities), England 2023**




Source: Data extracted from the Sexual and Reproductive Health Profiles.

# Health inequalities and communities with greater sexual health needs

Many STIs particularly affect socially disadvantaged or marginalised groups who already experience poor health outcomes. The Variation in outcomes in sexual and reproductive health in England toolkit (Public Health England (PHE) 2021) is a guide to using data and sexual and reproductive health indicators to explore between and within local authority differences to understand where variation and disparities occur, identify the principal causes and underlying factors, inform ways to target and reduce sexual and reproductive health inequality and improve outcomes.

Prevention of HIV and STIs should be targeted at communities with greater sexual health needs. In England, this includes young people, GBMSM and some minority ethnic groups. It is important to note that this does not mean that every member of these groups is at high risk of an STI.

## World Health Organization (WHO) key populations

WHO has defined 5 key populations in the context of global HIV, hepatitis and STI programmes. These are:

- men who have sex with men
- trans and gender diverse people
- sex workers
- people who inject drugs
- people in prisons and other closed settings

For STIs, WHO advocate more focus to provide integrated STI services for key populations everywhere, and for the general population in higher STI burden settings.

## GBMSM

Analysis of data from the third National Survey of Sexual Attitudes and Lifestyles (Natsal-3) (2), a large national survey using a representative sample, estimated that 2.6% of all men in Great Britain were GBMSM, 52.5% of whom identified as gay.

GBMSM were more likely to report sexual behaviours, such as condomless sex and more partners, than other men and poorer sexual health outcomes including STI diagnoses.

National STI surveillance data show that in 2023, the rate of new STI diagnoses was higher in GBMSM (13,022 per 100,000) compared to all men (772 per 100,000). New STI diagnoses among GBMSM have been increasing since the early 2000s. In 2023, 6,527 (69%) of syphilis and 40,586 (48%) of gonorrhoea diagnoses were in GBMSM (1). Certain less common STIs are

mostly diagnosed among GBMSM in the UK and other higher income countries. These include lymphogranuloma venereum (LGV), sexually transmitted shigellosis, hepatitis A and mpox, recently recognised as a sexually transmissible infection.

Health surveillance data, outbreak investigations and interviews with those affected consistently show that GBMSM in dense sexual networks or with specific behaviours are at most risk of acquiring STIs (3 to 5). Behavioural factors that increase risk include more sexual partners, chemsex and group sex, which may be facilitated by geosocial networking applications. Alongside having a previous recent STI diagnosis (which is a reliable predictor of future STI risk) these factors have been used as proxies of higher risk to define those GBMSM eligible for targeted interventions such as mpox vaccine during the 2022 international outbreak.

The advent of HIV pre-exposure prophylaxis (PrEP) has been cited as a factor contributing to the rise in STIs. In England, the largescale PrEP Impact Trial (6), found that, all other factors being equal, those taking PrEP were 1.66 times more likely to be diagnosed with an STI than others. It also found that 80% of STIs were diagnosed within 24.5% of trial participants and concluded that “The high incidence of bacterial STIs among participants, concentrated within a subgroup of PrEP users, presents an opportunity for tailored STI control measures”. These results are consistent with the findings from a large multisite Australian study (7) where 25% of participants accounted for 76% of STIs diagnosed and 2 smaller, earlier studies from Canada (8) and California (9).

Surveys have been used to understand the prevalence of chemsex in the UK. The 2016 to 2017 Reducing inequalities in Sexual Health (RiiSH) survey of GBMSM, recruited through SHS and social networking or dating apps in England, found that 1 in 10 participants had engaged in chemsex in the past year and were at greater STI risk but also engaged more actively with SHSs (10). Findings from a survey of SHS users in urban and rural areas (11) were consistent with this picture. A briefing for commissioners and providers of drug and alcohol services (12), highlights issues relating to chemsex, including barriers and facilitators to help commissioners and providers plan services and understand, assess and meet the needs of their local population.

GBMSM experience inequalities in other areas, such as greater fear of stigma and discrimination, worse mental health, and use of alcohol, drugs and tobacco. The interaction between mental health, drug and alcohol use and sexual risk is recognised in a Framework for promoting the health and wellbeing of GBMSM published by PHE in 2014.

The tailored approach to preventing STIs among GBMSM includes specific testing and vaccination recommendations. Guided by a holistic sexual health risk assessment this can include testing for a wider range of infections, or at an increased frequency and offer of targeted vaccination. The British Association of Sexual Health and HIV (BASHH) guideline on sexual healthcare of men who have sex with men (13) summarises the evidence and recommendations. In addition, there are more recent developments such as the use of post

exposure prophylaxis for STIs (dPEP, sometimes referred to as doxyPEP) and vaccination to protect against mpox and gonorrhoea (all of which are covered later in this document).

Testing samples from sites where infections are more likely to be asymptomatic, for example pharyngeal and rectal samples for gonorrhoea and chlamydia, is also more regularly recommended for GBMSM than other key groups (14). This testing approach contributes to higher detection of bacterial STIs in GBMSM.

Vaccination is offered to GBMSM in SHSs, against sexually transmitted and sexually transmissible viruses. HPV vaccine is offered in a selective programme for GBMSM aged 45 years and under. This began as a pilot in June 2016 and was extended to all SHSs in April 2018. Routine adolescent HPV vaccination was extended to boys in 2019 (15). Rates of genital warts in GBMSM have fallen overall with the biggest effects seen in younger age groups where protection from both the targeted and routine programmes will be seen (1).

## Heterosexual-identifying men who have sex with men (HI-MSM)

HI-MSM are men who have sex with other men and with women, who do not define themselves as gay or bisexual. As a result, HI-MSM may be less likely to engage with prevention messages targeted to gay and bisexual men. They may also be reluctant to access sexual healthcare services and be less aware of their risk of acquiring STIs, HIV and other bloodborne viruses. Analysis of data from Natsal-2 examined sexual risk behaviours of behaviourally bisexual men and other men to examine the potential role in overall population STI and HIV transmission dynamics (16).

A detailed study (17) explored the barriers to and facilitators of testing for HIV and STIs for HI-MSM in England. It found that while HI-MSM overall may be at lower risk of STI and HIV acquisition than GBMSM, there was evidence suggesting that HI-MSM are at higher risk of poor sexual health than the general population, and that a significant proportion have a high risk of STI and HIV acquisition.

## Young people

Young people, aged 15 to 24 years, experience the highest STI diagnosis rates, and this is likely due to the higher rates of partner change among people at this stage in their lives. Young women are more likely to be diagnosed with an STI than their male counterparts, which is attributed to:

- the higher proportion of young women tested for chlamydia, the most commonly diagnosed STI, through the National Chlamydia Screening Programme (NCSP), which targets women in this age group
- disassortative sexual mixing by age and gender, whereby young women are more likely to have sexual partners who are older (with a higher risk of exposure to STIs) compared with their male peers (18, 19)

Diagnoses of bacterial STIs have been increasing among people of all ages but while those aged 15 to 24 years make up 12% of the population they account for over a third of all gonorrhoea and over half of chlamydia diagnoses each year (1).

Around 1 in 5 (20%) women aged 15 to 24 years were tested for chlamydia in 2023. Nearly 1 in 10 (9.6%) of these tests was positive (1). As chlamydia is a largely asymptomatic infection, increases in the number of infections diagnosed and treated is an indication of improved chlamydia screening provision.

Meanwhile, there has been a sustained decline in the rate of first episode genital warts in young people as a consequence of the routine school-based HPV vaccination programme. In 2012, the programme began using the Gardasil® vaccine, protecting against types of HPV that cause genital warts in addition to the main cervical cancer-causing types.

Vaccination was initially for all girls aged 12 to 13 years and expanded to include boys from 2019. Thus, in England in 2023, women in their early 20s and younger have had the highest coverage of HPV vaccine, and consequently are the group who have seen the largest reduction in genital warts.

The rate of first episode genital warts diagnoses among young women aged 15 to 17 years in 2023 was half that of their counterparts in 2019. A reduction was also seen in heterosexual young men of the same age over the same period and in both men and women aged 18 to 24 years, most of whom will have had direct or indirect (herd) protection from vaccination (1).

## Ethnic minorities

While the majority of STIs, over 60%, are diagnosed in people of white ethnicity when different background population sizes are taken into account it shows that STIs disproportionately affect ethnic minorities. People of black Caribbean ethnicity have notably higher diagnosis rates for most STIs, followed by other black and mixed ethnicities, while Asian ethnic groups have the lowest diagnoses rates (1). There is diversity within these broad ethnic categorisations that is evident but not fully describable through national surveillance data (20) and where focussed research can add depth.

Several studies have examined these ethnic differences, considering the effects of mixing patterns within sexual partnerships (assortativeness) (18), sexual and health seeking behaviours; and wider determinants of health (such as socio- economic circumstances and education) (21, 22, 23). These analyses use data from different sources and give a consistent picture of the ethnic disparities in rates of STIs. In some, part of the difference is explained by ethnic variations in age; area level deprivation or patterns of service use but none identify any specific determinant of ethnic differences in sexual health in England. Thus, when comparing STI rates by ethnicity, the effect of different population age structures, socio-economic factors, different levels of service use and geography should be considered at the same time.

A systematic review (24) found that people from a black Caribbean background in the UK often have sex for the first time at a younger age, have a greater numbers of partners overall and have higher rates of sexual partnership concurrency (having more than one sexual partner in the same period of time). However, increased STI risk among people from a black Caribbean background is only partially explained by variations in socio-demographic factors and sexual behaviours. It also found that people of black Caribbean ethnicity were more likely to access SHSs than those of white ethnicity. This review was part of a package of work to support promoting the sexual health and wellbeing of people from a black Caribbean background, which is summarised in a document published by PHE (25).

## People living in deprived areas

Socioeconomic deprivation is a determinant of poor health. Using the Index of Multiple Deprivation (IMD) as a measure of relative deprivation by residence area, diagnosis rates of STIs are shown to be highest among people living in the most deprived areas of England (1) and in population-based prevalence measures from Natsal-3 (26).

## Lesbian, gay, bisexual, transgender and other sexual and gender identities (LGBT+)

Further to the disproportionate burden of STIs among GBMSM (discussed separately), other sexual minorities also have particular sexual health needs.

### Lesbian and bisexual women

Evidence reported in the Improving the health and wellbeing of lesbian and bisexual women report describes higher rates of some types of infection that are associated with sexual activity, such as bacterial vaginosis. Lesbian and bisexual women are less likely to have undertaken STI testing than heterosexual women, suggesting a potentially unmet need.

### Trans and non-binary people

The UK National lesbian, gay, bisexual, and transgender (LGBT) survey (27) found that trans people were less likely to have attended a SHS in the past 12 months and were more likely to report experiencing discrimination in healthcare compared to cisgender people. The GUMCAD STI Surveillance System was updated in 2019 to enable SHSs to report data on STI service provision and diagnoses among trans and non-binary people accessing services in England. This information will help to inform the needs and provision of SHSs for trans and non-binary people.

## People in contact with the Health and Justice system

There are higher rates of STIs in people in prisons compared to the general population. For this reason, National Institute for Health and Care Excellence (NICE) guidance on the physical health of people in prisons (28) recommends that prisoners should be assessed for risk of STIs when they enter or transfer between prisons.

BASHH has published standards for the management of sexual health in UK prisons (29). There are 9 standards covering STI diagnosis and management, public health measures and some reproductive health issues. These aim to improve sexual health provision in prisons to achieve high quality care, equitable to that which is provided to the general population.

## Sex workers

Sex workers are a key population group for STI prevention. Sex workers and their clients can be part of a dense interconnected sexual network and have regular or casual sexual partners outside of that network. It is estimated that there are in the region of 73,000 sex workers in England (30). This figure comprises a diverse and evolving picture of sex work.

An analysis of surveillance data from SHSs in England (31) found those who identified as female sex workers had a higher risk of certain STIs such as gonorrhoea and chlamydia and complications of infections such as pelvic inflammatory disease (PID). They also were more likely to have an HIV test, or a sexual health screen than other SHS clinic attendees. A corresponding analysis described SHS attendees who identified as male sex workers (32). It found a small but diverse population with higher rates of gonorrhoea and chlamydia compared to other male SHS attendees.

An analysis of Natsal data (33, 34) to examine the extent, characteristics and role of men who pay for sex in transmission of STIs, found that men who pay for sex were more likely to report STI diagnoses and a higher number of sexual partners than other men, of whom a minority are paid partners.

BASHH has published clinical standards for the sexual health management of people involved in sex work (35), with 8 standards including improving access to services and a tailored approach to assessment, testing, treatment and follow-up as well as health promotion and safeguarding.

## Older adults

Despite having relatively low rates in comparison to other age groups, there has been a steady increase in diagnoses of STIs among people aged 65 years and over. In 2023 there were around 2,900 diagnoses of STIs in this age group. The Natsal surveys (36) include measures of sexual activity continuing into later life; confirming the need to understand the sexual health needs of people aged 65 years and over and to promote good sexual health and wellbeing through the life course.

## People with disabilities

A study based on the Natsal survey (37) found that 1 in 10 participants aged 17 to 34 years reported having a limiting disability, with most having one or more physical and/or mental health condition(s). Sexual behaviour was broadly similar to young adults without disabilities but

women with a limiting disability, in particular, were more likely to report adverse sexual outcomes, including non-volitional sex, younger age at sexual debut and STI diagnoses.

Many support and advocacy organisations for conditions which lead to disability have tailored resources about sex, intimacy and relationships on their websites that cover a range of topics from an informed perspective.

### Refugees, asylum seekers and migrants

The PHE migrant health guide provides advice and guidance on the health needs of migrant patients for healthcare practitioners and includes a number of sections covering aspects of sexual and reproductive health including STIs, which refer back to BASHH standards for the management of STIs.

## Demographic, societal and other changes

### Office of National Statistics population data

Demographic and societal changes influence patterns of health and illness including STIs. The 2021 census provides updated information at a national and local level about changes in the population over the previous decade that are important to interpret the trends and patterns seen over time; in particular considering changes in population age structure, sexual orientation, ethnicity and geography of residence may be relevant factors within the local epidemiology of STIs. Local level data is available. General explorations of changes in the population over time, such as the interactions between age and ethnicity, have been published.

Population data exploration:

- census maps: exploration of local census data including population and identity
- mapping income deprivation at a local authority level, Office for National Statistics (ONS) 2021: including links to underlying data
- UK population by ethnicity analyses, ONS 2023: analysis of changes in age profile and ethnicity between the census 2011 and 2021

Population data sets; local level population data from the 2021 census:

- sexual orientation by age and sex
- ethnic group by age and sex

### Natsal

The serial Natsal surveys have been conducted every 10 years since 1990. They provide a scientific study of sexual behaviour and use a method that means findings are broadly representative of the British general population. The last survey (Natsal-3) was run between

2010 and 2012. Since then, there have been significant societal, individual-level and technological changes, along with shifts in public health priorities and service delivery, which influence sexual attitudes, lifestyles and health outcomes. As a result of this, Natsal-4, which collected data between September 2022 and April 2024, will provide updated data on sexual lifestyles in the context of today's society.

## Travel

International travel is a factor in the global spread of STIs. Sex while travelling or travelling for sex is an evolving and complex picture. A review of recent evidence related to STIs and travel (38) summarises studies that show sexual contact is common among people traveling for leisure, visiting friends and relatives, business, and seasonal or other work.

Although not limited to any gender, sexual orientation, or age group, being single, a man, and of younger age is associated with greater occurrence of sex abroad. Sex in a country with higher prevalence of STIs, increases a traveller's risk of infection. Where there is also a higher prevalence of AMR in STIs these infections may also be more difficult to treat. As an example, almost all cases of ceftriaxone resistant gonorrhoea seen in the UK to date are linked to travel to or from countries in the Asia Pacific region where these strains are more common (39).

International travel to gatherings at Pride events, festivals and parties increases connectivity across global sexual networks, particularly for GBMSM. The key role that these global networks play in the epidemiology of STIs has been seen in recent years in multi country outbreaks which expanded rapidly through global sexual networks:

- the mpox clade IIb outbreak of 2022 reached more than 100 countries within 4 months of first recognition of the new strain of the virus
- a rapid risk assessment by the European Centre for Disease Prevention and Control (40) summarised the international spread of a new extensively-drug resistant strain of an extant cluster of *Shigella sonnei*, which had previously been circulating as a multi country outbreak since 2014 and regularly detected in England
- a hepatitis A outbreak spread across Europe during 2016 and 2017 (41)

These outbreaks are recognised and visible because they involve novel agents or strains but more common STIs will also be circulating and sustained within global networks.

## The COVID-19 pandemic

Disruption to SHSs during the response to the COVID-19 pandemic, from March 2020, led to a decrease in STI testing and diagnoses. Online provision of remote self-sample STI tests increased rapidly and, with telephone consultations, enabled the number of contacts with services to return to pre-pandemic levels during 2021. The number and proportion of face-to-face consultations has remained lower than pre-pandemic levels, with around half of consultations in person during 2023 (1).

There was reduced social and sexual contact during periods of lockdown (42, 43) but sexual contact and the need for SHSs continued (44, 45). The Natsal-COVID study found that intimate physical contact with a non-cohabiting partner was most common among young people aged 18 to 24 years (18%) and people identifying as gay or lesbian (20%), 2 groups with greater sexual health needs. Additionally, young people and those reporting sexual risk behaviours had difficulties accessing services during and immediately after the first national lockdown, leading to a possible backlog of STI-related need (46).

Diagnoses of STIs overall, particularly syphilis and gonorrhoea, increased rapidly following the removal of restrictions on social mixing and travel in July 2021 (47). The marked increase in gonorrhoea was seen across the UK and in many other countries, especially in younger people (48). Other infections, notably those that are usually diagnosed at an in-person appointment or examination, like genital herpes, have not returned to pre-pandemic levels.

Longer-term and indirect effects on sexual health outcomes from the pandemic response, such as the reduction in hepatitis B and HPV vaccinations, will take time to emerge and further observation is needed to understand this.

## Emerging or re-emerging STIs

A review by Williamson (49) describes how changes in pathogens, in environments, behaviours and host factors have contributed to the emergence, re-emergence and spread of a number of ‘non-classical’ sexually transmissible infections. These are categorised as enteric pathogens (for example, *Shigella* and hepatitis A virus), those spread by close contact (for example, mpox), and other pathogens that can spread through sexual contact although it is not the main route of infection (for example, Zika virus).

## Shigellosis

*Shigella* spp. are bacteria that cause dysentery: acute diarrhoea, blood in stools, abdominal cramps and fever. Transmitted through the faecal-oral route it is often linked to consuming contaminated water or food while travelling to endemic low and middle income countries.

Shigellosis was recognised and described as a sexually transmissible enteric disease in the 1970s. From the early 2000s a number of outbreaks and prolonged periods of higher than average cases, primarily affecting GBMSM, have been documented (50, 51). The current picture is of an endemic infection with over 2,000 cases among GBMSM reported in 2023 (52). This will be a substantial underestimate of the true picture.

A recent study (53) analysed UK sequence typing data and demonstrated that carriage of *Shigella* can last for months and reinfection (even with the same strains) can recur, concluding that a combination of persistent carriage, strain replacement, waning immunity and cyclical re-infections are likely to contribute to sustained transmission.

A systematic review (54), describes living in urban and capital regions, seeking sex and chemsex using geosocial mobile phone apps, visiting sex on premises venues, living with HIV or using HIV PrEP, multiple non-regular partnerships and other STIs as common factors for shigellosis in GBMSM. These factors are also associated with other STIs that predominantly affect GBMSM, indicating that they occur within a specific sexual network.

While most people recover from shigellosis without treatment, severe or persistent symptoms may need antibiotics and might require care in emergency services, sometimes leading to hospitalisation. A retrospective case record review (55) examined all cases of shigellosis diagnosed in a London hospital over a 4 year period and found 18.9% were admitted to hospital for a median of 5 days and 10.1% experienced complications.

## Syphilis

Although syphilis has been a recognised condition for centuries, diagnoses in England fell to less than 400 a year at the end of the 1980s and stayed low until the end of the 1990s (see Figure 2), which means that even within SHSs a case of syphilis would be a rarity during that period. The steady increase, since the early 2000s, reached 9,513 diagnoses of infectious syphilis in 2023.

Although diagnoses remain highest in GBMSM, increases have also been seen in heterosexual men and women. Rates are particularly high in some, mainly urban, parts of the country. However, in 2023, syphilis cases were increasing in most local authority areas in England. The rates of syphilis diagnoses returned to pre-Covid levels more quickly than other STIs, despite testing rates initially remaining lower. This reflects the longer duration of syphilis infections, the fact that they persist without treatment and that this infection is becoming more endemic. These trends are discussed in the Tracking the syphilis epidemic in England report (2013 to 2023).

## LGV

LGV is caused by an invasive form of *Chlamydia trachomatis*, the bacteria that causes chlamydia. A 2015 study (56) describes the emergence in 2003 and rapid increase of LGV among GBMSM in the UK. UKHSA's trends of LGV in England report (2019) describes the continued and steeper rise in LGV more recently and a steady shift in association with HIV, which began in 2017, as the use of HIV PrEP became more widespread, such that most cases are now among HIV negative GBMSM, although those living with HIV remain disproportionately affected.

## Mpox

Mpox is a zoonotic infection, caused by a poxvirus, that is endemic in West and Central Africa. Prior to 2022, cases diagnosed in the UK had been occasionally imported from endemic countries or were in contacts of these imported cases. In May 2022, a new pattern of mpox infection, spread through close sexual contact, became apparent in England and worldwide. The outbreak was mainly, but not exclusively in GBMSM who had not travelled to endemic

countries. International spread was extensive and rapid with cases reported from more than 100 countries in all world regions within 4 months of first being recognised.

Over 3,500 individuals were diagnosed in England during the peak of the outbreak in 2022. Cases have continued to occur at a low level since, with 137 reported in 2023. Of these, 64 were assumed to have acquired mpox in the UK, 54 outside the UK and the remaining 20 are currently unclassified. The latest mpox figures are available in the UKHSA mpox clade IIb outbreak: epidemiological overview, and data on the Mpox outbreak: global trends is maintained by WHO.

## Other emerging STIs

The combined effect of increasing population growth and urbanisation with climate change has led to an increase in the frequency and magnitude of outbreaks of many zoonotic and vector-borne diseases, some of which have recently been confirmed as sexually transmissible.

During and following the largescale Ebola virus outbreak in West Africa in 2014 to 2016, the persistence of Ebola virus in semen for a prolonged period after recovery was demonstrated (57) thus raising the prospect that it could spread sexually. Moreover, the range of invasive mosquito species such as Aedes albopictus is increasing in Europe due to climate change. This mosquito carries and transmits Zika virus, which causes severe birth defects if caught during pregnancy. Although not the main route of transmission, Zika virus has been confirmed as being sexually transmissible, thus prevention of sexual transmission of the virus is part of public health advice for travellers retuning from endemic or outbreak areas (58).

Horizon scanning continues in order to detect and monitor outbreaks of other emerging or re-emerging infectious diseases internationally which may be sexually transmissible, followed up with rapid risk assessments to inform public health advice.

# 2. Antimicrobial resistance (AMR)

## WHO bacterial priority pathogens

*Neisseria gonorrhoeae* and *Shigella* spp. are classified as high priority on the list of WHO priority pathogens 2024. This means they are considered to be significantly difficult to treat antibiotic resistant bacterial pathogens that cause a substantial disease burden (mortality and morbidity), show increasing trends in resistance, are uniquely difficult to prevent, are highly transmissible and for which there are few potential treatments in the development pipeline. Although they may not be critical globally, pathogens in this category could be critical for some populations and in specific geographical areas.

### Gonorrhoea

*Neisseria gonorrhoeae*, the bacteria that causes gonorrhoea, has increasingly limited treatment options, rising diagnoses and potentially severe sequelae. *Neisseria gonorrhoeae* has successively developed resistance to every class of antibiotic used to treat it. Ceftriaxone is the last currently available option for empirical therapy and is recommended as first-line treatment by BASHH.

Since 2000, gonococcal resistance has been monitored in England and Wales via the Gonococcal Resistance to Antimicrobials Programme (GRASP). This surveillance indicates that in England the circulating strains of *Neisseria gonorrhoeae* remain susceptible to ceftriaxone, that resistance to azithromycin and ciprofloxacin (former treatment options) continue to increase and tetracycline resistance remains high (above 60%). While tetracyclines are not a recommended treatment for gonorrhoea, high levels of resistance suggest that doxycycline used as dPEP will be limited for preventing gonorrhoea (see later section on dPEP).

Reports of individual cases of ceftriaxone resistant *Neisseria gonorrhoeae* detected in England are increasing (39). To date these have all been linked to travel to or from parts of the world where ceftriaxone resistance is more common. Initially all cases were managed as national incidents (59) and this led to precedents that were used to inform the development of standardised guidance on Managing incidents of ceftriaxone-resistant *Neisseria gonorrhoeae* in England 2022.

Microbial culture is used to grow bacteria from a positive sample in the laboratory for identification and antimicrobial susceptibility testing. Although culture for *Neisseria gonorrhoeae* is less sensitive than nucleic acid amplification tests (NAATs), it is still required to identify infections that are resistant to first line treatment and inform individual patient management (especially where treatment failure is suspected) and for national public health surveillance. Wherever possible, samples for culture must be taken before treatment starts in all patients with suspected gonorrhoea or with a confirmed positive NAAT (60). In some individuals, multi-site sampling is recommended (from the urethra, rectum and pharynx) as extragenital sites are

thought to play an important role in the development of resistant strains and onward transmission.

Primary diagnostic laboratories are asked to refer *Neisseria gonorrhoeae* isolates with suspected ceftriaxone resistance to the UKHSA national reference laboratory for antimicrobial susceptibility testing and confirmation. Reporting and confirmation of treatment failures are crucial for detecting emerging resistance and preventing onward transmission.

## *Mycoplasma genitalium*

*Mycoplasma genitalium* is a sexually transmitted bacteria causing non-gonococcal urethritis (NGU) and PID. The prevalence of *Mycoplasma genitalium* infection is about 1% in the general UK population (aged 16 to 44 years), and up to 38% in those attending sexual health clinics (61). *Mycoplasma genitalium* has high levels of multidrug resistance worldwide.

In England, a pilot surveillance project assessed that *Mycoplasma genitalium* resistance to azithromycin (a macrolide, first-line therapy) was widespread (69%), but resistance to fluoroquinolone (second-line therapy) (8%) and dual-drug resistance to both (5%) were less prevalent. Treatment failure with azithromycin occurred in one in 10 instances. Full scale *Mycoplasma genitalium* AMR surveillance (MARS) began in 2023. MARS reports are published by UKHSA.

BASHH guidelines for the management of infection with *Mycoplasma genitalium* (61) recommend *Mycoplasma genitalium* testing for people presenting with NGU or PID, and their current sex partners. It is recommended that all *Mycoplasma genitalium*-positive specimens should be tested for macrolide resistance mediating mutations prior to prescribing treatment. Fluoroquinolone resistance testing is available at the UKHSA reference laboratory for cases which have failed fluoroquinolone treatment.

## *Shigella* spp.

Increasing AMR in shigellosis is a challenge for management of severe cases. Data from the Sexually transmitted *Shigella* spp. in England: 2016 to 2023 report indicates that in recent years, over 90% of cases diagnosed are multidrug resistant (MDR) or extensively drug resistant (XDR). Whole genome sequencing identifies genetically similar clusters of *Shigella* spp., some of which become persistent and widespread and periodically acquire new AMR conferring genes through horizontal transfer from co-circulating strains (62).

Although most cases of shigellosis are self-limiting and only require supportive care, antibiotics are used to treat cases with prolonged symptoms, severe colitis, or complications such as sepsis. BASHH guidelines for the management of sexually transmitted enteric infections (63) advise that empirical (presumptive) or susceptibility testing guided antimicrobials for patients with suspected or proven sexually transmitted proctocolitis should only be considered when: the patient is hospitalised, pyrexial, the diarrhoea has been present for at least 7 days and/or there

are significant comorbidities (frailty, inflammatory bowel disease, immunocompromised, including advanced HIV).

## Syphilis, chlamydia, and trichomoniasis

Syphilis, chlamydia infections (including LGV), and trichomoniasis, are currently easily treated with first-line antimicrobials, however there are some concerns and issues with AMR for these pathogens. *Treponema pallidum*, the causative agent of syphilis, has been managed in the UK with intramuscular benzathine penicillin for over 70 years and this remains an effective treatment. Macrolides are no longer recommended as an alternative because of resistance and treatment failure, including documented adverse outcomes in pregnancy (64). A review of published data (65) found that the levels of resistance varied globally, but were very high in some studies (greater than 90%). The BASHH guidelines for management of syphilis and the management of syphilis in pregnancy (66) provide advice for management of patients who report a penicillin allergy.

A review of AMR in bacterial STIs (67) notes isolated instances of *Chlamydia trachomatis* resistance to both doxycycline and azithromycin and reports estimated treatment failure in up to 11% of patients given azithromycin. While the reasons for these findings are unclear, there is no evidence of widespread genotypic AMR in this organism. Although, as other (non-human) species of chlamydia have developed antibiotic resistance the potential for this to occur is a concern. In 2018, the BASHH guidelines for the management of infection with *Chlamydia trachomatis* (68) changed the first line treatment for chlamydia to doxycycline because of evidence that the previously recommended regimen (single dose azithromycin) was inadequate for the treatment of chlamydia at some sites and had potential to select for macrolide resistance in *Mycoplasma genitalium* (as a common co-infection). The guidelines provide advice for the management of patients for whom doxycycline is contra-indicated.

Trichomoniasis caused by *Trichomonas vaginalis* can be resistant to the first-line therapy, metronidazole. It is not well measured but thought to be uncommon. A study from 6 US cites in 2009 to 2010 measured 4.3% resistance, mainly at a low level (69), while a case note review spanning 4 years 1998 to 2002 in a UK sexual health clinic found 1.7% treatment failure (70). The BASHH guidelines for the management of *Trichomonas vaginalis* (71) provides advice on treatment following non-response to standard therapy (having excluded re-infection and non-adherence).

## Reporting treatment failure

Monitoring treatment failure is another route to detect AMR. SHSs in England are requested to report treatment failure for gonorrhoea, *Mycoplasma genitalium*, chlamydia and trichomoniasis using the online reporting tool, which can be found on the UKHSA's restricted-access HIV and STI Data Exchange.

# 3. Health outcomes

Poor outcomes related to curable STIs are preventable through timely and effective testing and treatment. Nevertheless, a proportion of undiagnosed or untreated STIs continue to lead to harmful complications, including PID; tubal factor infertility (TFI); ectopic pregnancy; cervical cancer; perinatal, congenital or disseminated infections; cardiovascular and neurological complications, and increased susceptibility to HIV. STIs are also often associated with shame, social stigma and intolerance, all of which can dramatically impact an individual's wellbeing and quality of life.

While the link between STIs and specific complications is well established, there is uncertainty about the likelihood that infection with a particular STI will progress to conditions such as PID or TFI. Symptoms may be treated without testing for, or identifying the causal infection and there is a lack of reliable studies assessing the long-term impacts of STIs. PHE's Return on investment tool provided estimates for sequalae attributable or associated with STIs based on a literature review of the evidence base, some of which are shown in Table 2.

**Table 2. Examples of sequelae associated with or attributable to STIs [note 3]**

| Health outcome | Associated STIs | Progression to morbidity or mortality |
|---|---|---|
| Pelvic Inflammatory Disease (PID) | Chlamydia | 17.1% of untreated chlamydia infections (72) [note 3]<br>6.7% of treated chlamydia infections (73) [note 3] |
| | Gonorrhoea | 14.0% of untreated gonorrhoea infections (60) [note 3]<br>6.7% of treated gonorrhoea infections (73) [note 3] |
| | *Mycoplasma genitalium* | 4.9% of untreated *Mycoplasma genitalium* infections (74) [note 3] |
| Tubal factor infertility (TFI) | Chlamydia | 0.5% of untreated chlamydia infections (72) [note 3]<br>0.2% of treated chlamydia infections (73) [note 3] |
| Ectopic pregnancy | Chlamydia | 7.6% with salpingitis (fallopian tube inflammation) (75) [note 3] |
| Neonatal conjunctivitis | Chlamydia | 14.8% of untreated chlamydia infections (if infected during birth) (76)<br>6.9 diagnoses per 100,000 live births (77) |
| | Gonorrhoea | 3.7 diagnoses per 100,000 live births (77) |
| Neonatal pneumonia | Chlamydia | 7.0% of untreated chlamydia infections (if infected during birth) (76) |
| Cancer | HPV | 850 UK deaths annually among women (685 in England) (78) |
| | Hepatitis B, hepatitis C | 600 diagnoses of liver cancer per year and liver disease (79) |
| Congenital syphilis | Syphilis | Up to 40% of babies with congenital syphilis may be stillborn or die (80) |
| Neonatal herpes | Herpes | 2 to 18 diagnoses per 100,000 live births (81), one third with the infection die (82) |
| Disseminated gonococcal infection (DGI) | Gonorrhoea | 0.5 to 3% of untreated gonorrhoea infections (83) |
| Syphilitic conditions | Syphilis | 12.2% of untreated syphilis (73)<br>• 4.5% of untreated syphilis leading to neurosyphilis (73)<br>• 30.0% of neurosyphilis leading to permanent disability (73) |

Note 3: Not all sequalae are quantifiable, so this table is non-exhaustive.

# Pelvic Inflammatory Disease (PID), tubal factor infertility (TFI) and ectopic pregnancy

PID is caused by infection of the upper genital tract, and typically affects young women. PID is commonly, although not exclusively, caused by bacterial STIs such as *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Mycoplasma genitalium*. Inflammation can affect a range of tissues and the risk of complications is increased with severe or repeated infection, and may include tfi, chronic pelvic pain and increased risk of ectopic pregnancy. Ectopic pregnancy occurs when a fertilised egg implants outside the uterus, usually in one of the fallopian tubes. Such pregnancies are not viable and, if left untreated, can lead to tubal rupture and consequent maternal morbidity and mortality. A Swedish study (75) followed 1,844 women with PID over time and found that 10.8% developed TFI and 9.1% experienced ectopic pregnancy.

A health technology assessment (72) assembled evidence to quantify and understand the role of chlamydia infection in causing these reproductive harms and concluded that “every 1000 *Chlamydia trachomatis* infections in women aged 16 to 44 years, on average, gives rise to approximately 171 episodes of PID, 2 ectopic pregnancies and 5.1 women with TFI at aged 44 years.”

Evidence synthesised from the Prevention of Pelvic Infection (POPI) sexual health cohort study (74) estimated that 4.9% of *Mycoplasma genitalium* in women progressed to PID.

# Preterm birth, spontaneous abortion and neonatal complications

STIs can result in serious complications during pregnancy and birth. Chlamydia, gonorrhoea, *Mycoplasma genitalium*, trichomoniasis, hepatitis B, hepatitis C, Herpes Simplex Virus (HSV), HPV and syphilis are all associated with adverse pregnancy outcomes if untreated.

# Congenital syphilis

Transmission of *Treponema pallidum* bacteria during pregnancy or birth can lead to stillbirth or complications and deaths in the neonate. Congenital syphilis can have major health impacts on an infant’s health causing a range of congenital anomalies affecting the bones, skin, and organs.

Despite very high (99.8%) syphilis testing coverage in antenatal care, congenital syphilis cases have increased in recent years. Strengthened surveillance began with a review of confirmed congenital syphilis cases diagnosed in England between 2015 and 2020 (84), with subsequent annual reports (64, 85). These reported 55 cases of congenital syphilis in England, among

which 23 babies were born to mothers who had screened negative at antenatal screening and had become infected later during their pregnancy.
Social inequalities, missed or late clinical presentations, treatment delays and poor engagement with services were identified as contributing factors. Health promotion, such as the National Health Service (NHS) England 'Negative Now' messaging, can reduce the incidence of congenital syphilis by raising awareness of the importance of maintaining good sexual health throughout pregnancy (66).

### Neonatal herpes

Herpes can be a life-threatening infection for babies. Infants exposed to the virus during childbirth may develop herpes encephalitis, respiratory distress, and skin lesions. HSV can be transmitted to babies born to women with recent (previous 6 weeks) genital herpes infection during pregnancy or vaginal birth, or through breastfeeding. Occurrences of this infection are increasing.

A study identified 226 hospitalised cases in England from 1998 to 2012 and found that the rate of neonates diagnosed in hospital with HSV increased nearly 4 times between 1999 and 2016 (86). Three studies undertaken via the British Paediatric Surveillance Unit (87, 88 and 89) showed successively increasing incidences of neonatal herpes. The most recent study found 118 cases over a 2.5 year period (2019 to 2022), 24% of whom died. BASHH and the Royal College of Obstetricians and Gynaecologists (RCOG) have produced guidelines for the management of genital herpes in pregnancy, 2014 (90).

## Other STIs affecting pregnancy and the newborn

A meta-analysis (91) found that *Mycoplasma genitalium* infection in pregnancy was associated with an increased risk of preterm birth (89% higher) and spontaneous abortion (82% higher).

Ophthalmia neonatorum is conjunctivitis of the newborn and can be caused by chlamydia or gonorrhoea infections transmitted during childbirth. Gonococcal opthalmia neonatorum tends to be more severe and can lead to blindness. Chlamydia infections can also cause pneumonia in newborns.

Transmission of HPV to neonates before or during delivery may lead to juvenile onset recurrent respiratory papillomatosis (JORRP); a rare disease that causes repeated and often aggressive growth of papilloma (HPV 6 or HPV 11) in the respiratory tract. It may take a number of years to develop and typically manifests between aged 2 to 7 years.

## Cancer

Several cancers are associated with sexually transmitted or sexually transmissible viruses. HPV is the primary cause of cervical cancer and a major contributor to penile, anal and genital

cancers and some cancers of the head and neck. Around 685 women die from cervical cancer in England each year (78). Adolescent vaccination against the most common cancer-causing HPV types began, in girls and young women, in 2008. As the first of those vaccinated have now reached the ages at which cervical abnormalities and cancers start to be detected, evidence of the impact can be seen with cervical cancer rates 87% lower in women offered HPV vaccination at aged 12 to13 years compared to the reference unvaccinated population (92).

It has been estimated that in 2012 8.6% and 29.5% of liver cancer could be attributed to hepatitis B and C respectively (93). Evidence supporting the association between Non-Hodgkins lymphoma and hepatitis C is summarised in a review (94). The proportion of cases attributable could be as high as 10% in countries with a high prevalence of HCV. Although not the main route of transmission, both of these viruses are sexually transmissible. Hepatitis B vaccination is recommended for individuals who change sexual partners frequently, including GBMSM and sex workers as well as for sexual contacts of people diagnosed with hepatitis B (95).

BASHH and British HIV Association (BHIVA) guidelines advise on testing for Hepatitis B and Hepatitis C in SHSs (14).

# Disseminated gonococcal infection (DGI)

DGI is caused by the spread of *Neisseria gonorrhoeae* into the bloodstream and can lead to septic arthritis, endocarditis, meningitis and osteomyelitis. The estimate that DGI occurs in 0.5 to 3% of patients with untreated gonorrhoea arises from several sources in the 1970s and 1980s (96). More recently, a retrospective study described 21 cases in France between 2009 and 2011 (97) and an unusual cluster of 16 cases was reported in North America (98). Surveillance of DGI in England has reported 25 confirmed and 7 probable cases (2019 to June 2023) (99). Given over 80,000 gonorrhoea diagnoses reported annually this is thought to be an underestimate.

# Syphilitic complications

It is estimated that 25% of untreated syphilis progresses to secondary disease, where the bacteria have become widespread in the body and can affect multiple organs and systems. Over time, this can lead to significant harm including severe cardiovascular, ocular and neurological complications. These include meningitis, strokes, seizures, psychosis, personality change, loss of co-ordination, numbness, blindness and heart problems and potentially, death. The BASHH guidelines on syphilis (100) summarises the timing and features of different syphilis stages and estimates the proportion of untreated individuals who may be affected by different complications.

# Epididymo-orchitis

In men, among other causes, local spread of STIs including chlamydia, gonorrhoea, trichomoniasis and *Mycoplasma genitalium* can lead to epididymo-orchitis, painful, swelling and inflammation of the epididymis and/or testes. BASHH guidelines on epididymo-orchitis provides advice on investigation, treatment and management of this condition (101).

# Proctitis

Proctitis is characterized by inflammation of the rectal lining. Symptoms include rectal pain, anorectal bleeding, rectal discharge, constipation and other symptoms of lower gastro-intestinal inflammation in addition to systemic symptoms such as fever and malaise. A number of different bacteria and viruses can cause proctitis. BASHH guidance on enteric infections (63) provides advice on investigation, treatment and management of proctitis.

# HIV

STIs increase the risk of HIV acquisition. They disrupt or damage the mucus membranes in the genital area though ulceration, inflammation or irritation, providing an entry point for the virus. In addition, the immune response to infection and inflammation increases the presence of CD4 cells to the site of infection, providing more target cells for HIV to attack. STIs also increase the risk of HIV transmission by increasing viral concentrations in genital secretions, thereby increasing the infectiousness of a person living with HIV.

# Stigma and discrimination

Sexual health is not just related to disease. It also includes physical, mental and social wellbeing in relation to sexuality. Stigma and discrimination can prevent individuals from getting early diagnosis and treatment, disclosing to friends and family and getting the support they need. A Natsal-3 study (102), found that stigma played a part in the choices people with genitourinary symptoms made about whether, where and when to seek help. The WHO Global health sector strategies on, respectively, HIV, viral hepatitis and STIs for the period 2022 to 2030 identifies a need to address stigma, discrimination and other social and structural barriers as a strategic shift towards ending these epidemics.

# Overview of main interventions to prevent, diagnose and manage infections

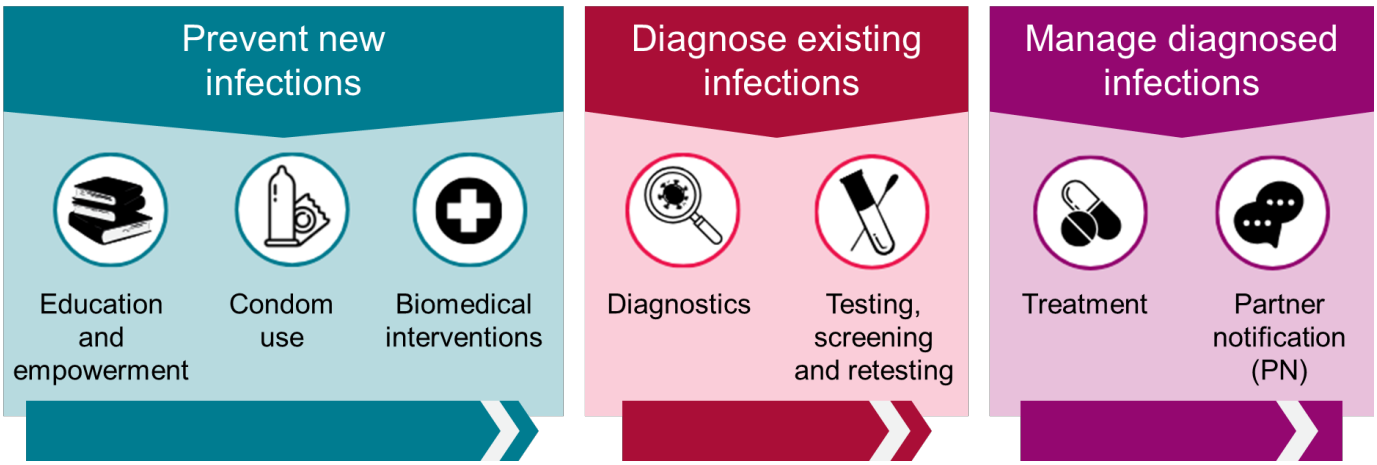
The following sections of this document aim to provide supporting information for the STI prioritisation framework, focusing on 3 key facets (Figure 5):

1. Preventing new infections:
    - education and empowerment
    - condom use
    - biomedical interventions

2. Diagnosing existing infections:
    - diagnostics
    - testing, screening and retesting

3. Managing diagnosed infections:
    - treatment
    - partner notification (PN) and management

**Figure 5. Main interventions across the care continuum**



# 4. Prevent new infections

Prevention of most STIs still rely on individual knowledge, behaviour and understanding of how to avoid STI acquisition or transmission. Influencing these behaviours includes universal interventions such as relationships, sex and health education (RSHE), targeted health promotion, and condom distribution. Good sexual health and reproductive health is important for everyone; however, STIs affect some population groups more than others, thus targeted and culturally competent interventions, particularly health promotion, are important to address these inequalities.

## Education and empowerment

Providing accessible and high-quality information that empowers individuals to manage their own sexual and reproductive health is essential for STI prevention. Resources need to be culturally competent and customized for populations that are at higher risk of acquiring STIs.

### Young people

A scoping review of sexual health promotion in the UK (103) found that the use of digital media for sexual health promotion has significant potential given the reach and popularity of the internet and mobile phones and that digital interventions have the potential to provide a cost-effective way to provide sexual health promotion, particularly promotion that appeals to young people. While access to the internet is almost universal, this does not mean that young people will have access to sexual health information online due to limitations such as shared computer space or filtering software on phones or other devices.

The scoping review also noted that digital approaches could be used to promote STI testing, encourage condom use, or encourage discussion with a healthcare professional about sexual health and are considered to be effective and feasible ways to reach young people.

Relationships, sex and health education (RSHE)
RSHE aims to give young people the information they need to help them develop healthy, nurturing relationships of all kinds, not just intimate relationships. Statutory relationships education, relationships and sex education and health education guidance requires that pupils at secondary level learn about intimate and sexual relationships including sexual health and that they should know:

- how different STIs, including HIV, are transmitted
- how risk can be reduced through safer sex (including through condom use)
- the importance of and facts about testing
- the prevalence of some STIs and the impact they can have on those who acquire them and key facts about treatment
- how the use of alcohol and drugs can lead to risky sexual behaviour

- how to get further advice, including how and where to access confidential sexual and reproductive health advice and treatment

A comprehensive review of reviews of school-based interventions to improve sexual health (104) found that school-based interventions, targeting risky sexual behaviour and HIV prevention were effective in improving knowledge and changing attitudes, behaviours and health outcomes. Additionally, evidence from Natsal-3 (105) found young people who cited school as their main source of RSHE were less likely to acquire an STI or experience an unplanned pregnancy.

# Condom use

## Preventing infection and reducing transmission

A WHO bulletin summarising evidence from studies into the effectiveness of condoms in preventing different STIs found condoms were effective in protecting men and women from chlamydia, gonorrhoea, HSV type 2, and syphilis and women from trichomoniasis (106). They are considered less effective for infections that are transmitted through close contact rather than through genital fluids.

The Faculty of Sexual and Reproductive Healthcare (FSRH) clinical guideline on barrier methods for contraception and STI prevention (107) provides evidence based recommendations on the effectiveness of condoms for prevention of different STIs including transmission through oral sex.

## Condom use and uptake

A survey of young people aged 16 to 24 conducted by YouGov (108) asked questions about use of condoms and reasons for using or not using them. Notable findings were that 1 in 20 (5%) sexually active young people said that they had never used a condom. While 30% reported having sex with someone new for the first time without using a condom.

When asked about barriers to young people using condoms 28% said they are expensive, 9% that they don't know where to get them and 25% that getting an STI is not a big enough issue to worry about using condoms. Twice as many young people said that the main reason for using condoms is to avoid pregnancy (58%), rather than to avoid getting an STI (29%).

These findings are consistent with a study to understand young people's use and non-use of condoms and contraception in Scotland (109), which included discussion groups to explore issues in more detail and co-design recommendations.

### Condom distribution schemes (CDS)

NICE guideline 68 (110) recommends the use of CDS for prevention of STIs. Targeting those most at risk is more cost effective. The NICE quality standard is that local authorities provide a range of CDS tailored to the needs of their populations.

Types of schemes and considerations:

1. Multicomponent schemes were recommended for young people in health, education, youth and outreach settings, which offer free condoms as well as additional services such as support and training to young people.

2. Single component schemes, such as:

- providing free condoms to people most at risk of STIs in settings that are convenient for them
- cost-price sales schemes to the wider population

A review of CDS in 2015 to 2016 in England (111) looked at distribution, types of outlets, use and costs of the schemes. It found that schemes were available in nearly all areas of the country. Most provision was through c-card schemes for registered users aged 13 to 24 years (aged 13 to 19 years in some areas). The majority of those using the schemes were aged 15 to 19 years, and the most common outlet was through pharmacies (30%). Coverage was estimated at around 3% of those aged 15 to 24 years (6% of aged 15 to 19 years).

### Interventions for increasing use of condoms

The home-based intervention study (HIS-UK) trial (112) aimed to promote condom use among young men by aiding them to find condoms they like and to feel more confident when using them. The trial compared face to face and digital approaches to usual care. Early findings from the HIS-UK trial indicate young men had more positive attitudes, more confidence and motivation to use condoms. Chlamydia diagnoses were lower in the intervention group (but not statistically significant due to small sample size).

The Safetxt clinical trial (113, 114) found that young people who received a series of automated text messages designed to promote safer sexual health behaviours reported increased condom use but that there was no reduction in the incidence of chlamydia and gonorrhoea at one year compared to those receiving unrelated text messages.

## Biomedical interventions

This section covers current and prospective vaccines and the use of antibiotics to prevent STIs.

### Vaccination

Vaccination is an established intervention to protect against some sexually transmitted and sexually transmissible infections (HPV, hepatitis A and B) and has been recommended for introduction as a targeted programme for mpox and gonorrhoea. There are candidate vaccines in trials for HSV and chlamydia, while other common STIs remain elusive to vaccine development at present.

### HPV vaccination

The UK national HPV vaccination programme protects against 9 types of HPV: 7 that cause cancer, and 2 that cause most cases of genital warts. Worldwide, 700,000 cases of cancers are caused by HPV (115) including cervical, penile, anal and genital cancers and some cancers of the head and neck; all of which the vaccine helps to protect against.

Vaccination has reduced the most frequent type, cervical cancer, to low levels in England in women born since September 1995 (92). Reductions in genital warts were seen from 2014, most evidently in young women, who received the quadrivalent vaccine since 2012 (at aged 12 to 13 years).

The adolescent vaccination programme was extended to boys in 2019. A selective programme has been in place for GBMSM aged 45 years and under through SHSs since April 2018, following a pilot (2016 to March 2018).

### Hepatitis A and hepatitis B vaccination

The Green book, chapter 18 recommends vaccination against hepatitis B for people who change sexual partners frequently. GBMSM, and sex workers are at particular risk of infection and should be offered vaccination. The chapter advises on post-exposure prophylaxis and immunisation for sexual contacts and partners of individuals diagnosed with hepatitis B. See the BASHH guideline on the management of viral hepatitides (116).

Hepatitis A virus is transmissible through the faecal oral route and can be transmitted during sexual contact. Outbreaks of hepatitis A have occurred among GBMSM in recent decades including a large multi country outbreak in 2016 (117). There were 670 confirmed cases in England and the episode highlighted variable vaccination policies around the country, with areas that had sustained high coverage in GBMSM through SHS having far fewer cases (118). The Green book, chapter 17 and BASHH guidelines (116) recommend that immunisation should be offered to GBMSM. In SHSs, this can be following a hepatitis A virus total antibody test; however, in an outbreak situation or if the patient may not return, a vaccine dose can be given at the same appointment as the test, without waiting for the results.

### Gonorrhoea prevention

Use of the 4-component recombinant protein–based (4CMenB) vaccine for the prevention of gonorrhoea has been advised by the Joint Committee on vaccination and immunisation (JCVI). The bacteria that can cause meningitis (*Neisseria meningitidis*) and *Neisseria gonorrhoeae* are genetically related which gives the potential for cross-protection from this vaccine. This vaccine has been shown to offer between 33% and 47% protection against *Neisseria gonorrhoeae.* Modelling studies show that targeted use of the vaccine for those most at risk of infection would be cost effective (119).

### Mpox

The Modified vaccinia Ankara–Bavarian Nordic (MVA-BN) (Imvanex®) vaccine developed for smallpox was used during the global Clade IIb mpox outbreak in 2022. The vaccine

effectiveness is estimated at 74 to 78% for 1 dose and 82 to 83% for 2. Infections are less severe among those who are vaccinated or who have had a previous infection (120). The JCVI statement on mpox vaccination (November 2023) recommended that mpox vaccination should be used within a routine programme, as a targeted vaccination for those at highest risk. Modelling suggested that this would be a cost-effective intervention to reduce the risk of future outbreaks. The green book chapter 29 provides guidance on immunisation against mpox.

### Vaccines under development

STI Watch website, collated by Advocacy Access Equity (AVAC), provides a clear up to date summary of the current status of vaccine development for most common STIs. WHO have also published pathogen-specific roadmaps for vaccine development. There are candidate vaccines in current or planned trials for chlamydia, genital herpes (as a therapeutic vaccine), and gonorrhoea (specific vaccines for *Neisseria gonorrhoeae*) as well as further studies of 4CMenB vaccine. There are also several trials underway for a vaccine against *Shigella* spp. There are no candidate vaccines presently for syphilis, *Mycoplasma genitalium* or trichomoniasis.

## Doxycycline post exposure prophylaxis (dPEP)

Studies and emerging real-life evidence demonstrate that doxycycline taken within 72 hours of condomless sex can reduce the acquisition of bacterial STIs among those with a higher risk of infection. A sub study of the IPERGAY trial (121) found that those taking dPEP had lower rates of chlamydia and syphilis, but not gonorrhoea, while a US trial (122) found the overall number of STIs was reduced by two-thirds (asymptomatic gonorrhoea, chlamydia and early stage syphilis). A US study (123) considered different prescribing strategies and found that offering dPEP for 12 months to those at higher risk on the basis of a current or recent STI diagnoses was effective in balancing the use of antibiotics versus the number of STIs prevented.

Several studies to further explore the efficacy and potential harms of doxycycline prophylaxis, particularly in relation to AMR, are ongoing.

Australia has recently published a consensus statement on the use of dPEP (124) and the US (125) has recently published guidance. A guideline for the UK is under development by BASHH.

# 5. Diagnose existing infections

This section covers the components of testing, screening, and re-testing. Optimising testing, treating and PN can lead to shorter duration of infectiousness and, therefore, have an impact on reducing the probability of transmission of STIs in addition to preventing harm to individuals from untreated infections.

## Diagnostics

Diagnostics for STIs need to be appropriate, accurate and timely. BASHH guidance on testing (14) summarises the sample type, sample site and test type to use for different infections dependent upon the presence and type of symptoms.

The BASHH standards for the management of STIs 2019 (126) included the expectations of sample testing turnaround times to be timely in order to convey results quickly and act appropriately. The quality measure is 4 working days or less for standard screening tests. And 9 days where supplementary testing or referral to the reference laboratory is necessary.

### Point-of-care (POC) testing

POC testing is performed at or near the person being tested with results available during the same visit. POC testing therefore has the potential to improve the time to treatment, reduce loss to follow-up, decrease onward transmission, and lower the risk of sequelae. The use of POC tests (POCTs) also has the potential to avoid unnecessary or sub-optimal treatment and increase antibiotic stewardship. Some POCTs are in use in SHSs ranging from microscopy in clinics commonly available to molecular diagnostic testing being performed in a small number of larger urban clinics.

Two recent reviews summarise details comparing the POCTs currently available (127, 128) for bacterial STIs, particular for syphilis, chlamydia, gonorrhoea and trichomoniasis. Although a number of commercial tests are available, only a limited number have achieved CE marking or approval from regulators such as the US Food and Drug Administration (FDA). The WHO have also published Target Product Profiles to help facilitate the development of POCTs for STIs (129).

### Inappropriate testing

There is an increasing supply of online, STI self-sampling and self-testing kits and services. These include NHS commissioned free services and a growing number of private and commercial suppliers.

Multiplex testing is being used in some cases to test for a range of organisms including some with doubtful clinical significance; to test for STIs that may cause harm but using an

inappropriate sample type; or to test when not indicated by symptoms or other sexual health risk assessment. In addition, use of these tests may not follow the recommended window period, which adds further uncertainty. The consequence is that there is demand for antibiotic treatment for infections that do not require management; the potential to miss diagnoses of concern and an increase in anxiety and distress for those individuals receiving results and mixed messages on their interpretation and severity.

The BASHH position statement (130) addresses concerns over the inappropriate use of multiplex testing platforms, and suboptimal antibiotic treatment regimens for bacterial STIs.

# Testing, screening and retesting

## Terminology in testing for STIs

### Frequency of testing

Clinically indicated testing of people at risk of acquiring STIs and how frequently they should be tested, for example, GBMSM with new sexual partners are recommended to test every 3 months; GBMSM with one exclusive partner are recommended to test annually.

### Asymptomatic testing

STI testing of people without any symptoms, either opportunistically or because they are a partner of someone who tested positive.

### Screening

Population level testing for a condition of a healthy asymptomatic person.

### Re-testing

For young people aged 25 years and under, who were found to be positive for chlamydia, to check for re-exposure and re-infection, which is distinct from a test of cure (TOC).

### Test of Cure (TOC)

A repeat STI test to check response to treatment, this is covered further under ‘Treatment’.

## Clinical guidance for testing

BASHH is the professional clinical body that developed standards for the management of STIs (126). They provide guidance for testing frequency and which STIs to test for. The minimum investigations, including for asymptomatic patients, are tests for chlamydia, gonorrhoea, syphilis, and HIV. Samples from extra-genital sites should be collected if indicated by the sexual history. People being tested for STIs should have the most accurate diagnostic test (chosen according to national guidelines) for each infection for which they are being tested. All diagnostic samples should be processed by laboratories in a timely fashion in order that results can be conveyed quickly and acted on appropriately.

## Screening for chlamydia infection

Chlamydia is the most commonly diagnosed STI in England and is often asymptomatic. Screening detects infections that otherwise may be missed. The prevalence of infection is highest in young sexually active people (aged 15 to 24 years).

The NCSP was first introduced in England in 2003. The programme was reviewed in 2017, to consider the up-to-date evidence on the natural history, prevention and control of chlamydia. The outcome of the review was published in 2019 (131). It found that there was no evidence of a reduction in chlamydia prevalence and considered that control of onward transmission was unrealistic.

It was therefore recommended to change the focus of the programme to prevent the adverse consequences of untreated chlamydia. As the harmful effects of chlamydia occur predominantly in women, in 2021 the NCSP was changed to focus the opportunistic offer of asymptomatic chlamydia screening outside of SHSs on young women, combined with reducing time to test results and treatment, strengthening PN and re-testing.

All young people will still be able to access chlamydia tests at SHSs and young men will continue to be contacted and tested through PN procedures.

Advice for offering an opportunistic screen for eligible individuals in settings outside of SHSs, includes an updated NCSP patient information leaflet, which focuses on the ease of the test and ability for the patient to do it themselves, as well as providing information on the health benefits of screening. Having chlamydia testing kits easily accessible is important to reduce barriers of offering a test.

## Improving access to services for testing

Providing testing at a variety of venues can help improve access to testing and sexual healthcare. Whilst online services could reduce some barriers to testing (and treatment), some people, particularly some of those with greater sexual health needs, might find them difficult to use. A study (132) found that those using online services (compared to clinic users) were more likely to be aged 20 to 30 years, female, white British, homosexual or bisexual, test negative for chlamydia or gonorrhoea and live in less deprived areas.

Various research projects are underway to establish the impact of digital STI testing on health inequalities, for example the National Institute for Health and Care Research (NIHR) funded ASSIST and Sequence Digital projects.

The NICE guideline on reducing STIs (133), included recommendations for improving uptake and increasing the frequency of STI testing. These were supported by 2 evidence reviews:

- effectiveness, acceptability and cost effectiveness of strategies to improve uptake of STI testing (134)

- effective and cost-effective interventions to increase frequent STI testing in very high-risk groups (135)

These include a range of recommendations to optimise accessibility, use and return of remote self-sampling kits, and for tailoring interventions to reach those at highest need.

## Home self-sampling

The NICE evidence review (134) supported the use of self-sampling kits to be used at home because of significantly higher uptake compared to clinic-based testing and evidence that (well-designed, practical and accessible) sampling kits are well received. By avoiding stigma and embarrassment around clinic testing a main benefit was to encourage people who have previously never engaged with services to test. Downsides included demand that could be greater than supply, regional variability in availability and wastage from unreturned kits. Further, that without clinic contact diagnosis, treatment and PN relied more on the person having the test to take the initiative.

Self-sampling is more suitable for chlamydia and gonorrhoea, than for tests which require a blood sample, which are more likely to be returned in an unsuitable state for analysis, or tests where false positives may occur, where clinic testing is required for confirmation.

Some groups might face specific barriers either accessing or using home-sampling kits, so it was recommended that self-sampling at home should be part of a suite of testing options and offered alongside in-person attendance at specialist clinics or in primary care, and outreach services based on local needs.

Online self-sampling has become an increasingly common way of testing within publicly funded SHSs, accelerated during the pandemic as a way to continue provision of testing while face to face services were disrupted. However, compared to testing at clinics, online self-sampling is cost-effective when at least 56% of self-sampling kits are returned for testing (134).

## Re-testing those who test positive for chlamydia infection

The BASHH guideline for the management of infection with *Chlamydia trachomatis* (68) recommends that everyone 25 years and under found positive for chlamydia should be offered a retest 3 to 6 months following treatment. This follows evidence that those diagnosed with chlamydia are at higher risk of a repeat infection, with consequent risks of complications, and that this occurs more among younger individuals.

### Antenatal clinics

In England, as part of the infectious diseases in pregnancy screening (IDPS) programme pregnant women and trans men who are pregnant are offered HIV, syphilis and Hepatitis B tests. Those who decline any or all of the screening tests, can ask to be tested at any time during their pregnancy. The coverage of antenatal screening for syphilis, HIV and hepatitis B in England remains high at over 99% (136).

# 6. Manage diagnosed infections

## Treatment

### Evidence based treatment

The BASHH Standards for the management of STIs (126) state that those diagnosed with an STI should receive treatment as quickly as possible, within 3 weeks, and be managed according to current BASHH national guidelines, including the provision of PN.

Ideally, people with a confirmed or suspected STI are referred to specialist SHSs. However, if these services cannot be accessed within a reasonable time, or if the person is unwilling to attend, the person can be managed in primary care if the appropriate expertise is available. Treatment advice is available for the management of gonorrhoea in primary care (137) and STIs in primary care (138).

Treatment needs to be timely as the longer a delay in treatment, the higher the probability of onward transmission of the infection and adverse clinical sequelae. In addition, a delay in treating partners increases the probability of the index case being re-infected.

BASHH national guidelines are available to ensure the appropriate management and treatment of STIs. Ensuring the correct use of antibiotics to manage STIs is essential for preventing the increasing AMR observed around bacterial STIs such as gonorrhoea and *Mycoplasma genitalium* (see Chapter 2).

#### Test of Cure (TOC)

A TOC is a test following treatment for certain STIs to ensure that they have been successfully treated (that is, to rule out treatment failure). TOCs happen between 2 to 6 weeks following treatment (depending on the organism). Currently, a TOC is recommended following treatment for STIs where AMR is an issue such as gonorrhoea and *Mycoplasma genitalium*. For chlamydia, a TOC is recommended in some circumstances for example: chlamydia in pregnancy, suboptimal adherence to treatment and persistent symptoms following treatment. BASHH guidelines indicate where a TOC is recommended.

## Partner notification (PN) and management

PN is the process of identifying, testing, and treating sex partners of a person diagnosed with a STI and is an essential component of STI control. PN benefits the individual diagnosed with the STI (the index patient) through preventing re-infection, and it also facilitates the treatment of their partners and helps to reduce the spread of STIs in their sexual network. Effective PN reduces onward infection and re-infection and the complications of infection. PN can achieve a high positivity of contacts.

Modelling indicates that within the NCSP, PN is a highly effective strategy for increasing treatment of infected individuals, since 65% of male partners of chlamydia positive women were found to be infected, 10 times higher than the wider population screened, increasing the case finding efficiency and improving cost effectiveness, and reducing the cost per case identified (139). The NCSP audits include assessment of PN numbers and rates in different settings.

A health technology assessment (140) looked at the effectiveness and cost effectiveness of traditional and new PN technologies for STIs, using a range of methods. The effectiveness on outcomes (such as re-infection rates, number of partners contacted and treated, identifying infections in partners) and acceptability of different PN methods vary.

Traditionally, PN was through patient referral, where the index patient contacted their partner(s), or provider referral, where the index patient provided contact details of their partner(s) so that staff at SHSs could notify them. A variation on this is contract or conditional referral where the provider informs the sexual partner(s) in case the patient fails to do so within an agreed period of time. A 2022 NICE review (141) identified that simple patient referral methods tend to be an effective and preferred method of PN, however it is also important to recognise when alternative referral methods may be appropriate.

## Developments in PN

Recent developments in PN also include concepts referred to as expedited partner therapy (EPT) and accelerated partner therapy (APT).

EPT is the clinical practice of treating the sex partners of patients diagnosed with STIs by providing prescriptions or medications to the patient to take to their partner without the healthcare provider first examining the partner. Clinical governance arrangements prohibit the application of expedited partner therapy in the UK.

APT can include 2 related approaches that diminish barriers to treatment while accommodating UK prescribing regulations by ensuring a limited interaction between partners and medical providers. In the APT Hotline strategy, partners call a health adviser or nurse who assesses them using a standard guide and directs persons deemed to be eligible to collect a treatment pack from the clinic reception staff. In the APT Pharmacy strategy, partners see a trained pharmacist for assessment and dispensation of treatment packs. Both strategies include an ‘assertive invitation’ to partners to seek HIV and syphilis testing.

A UK based study published findings from an exploratory trial to determine if APT improves PN rates (142). Available evidence suggests that APT increases partner treatment and decreases rates of STI reinfection (143). Research suggests APT can be safely offered as a contact tracing option and is likely to be cost saving for heterosexual people with chlamydia and might reduce the risk of repeat infection (144).

The LUSTRUM study is an evidence-based approach to optimise PN as a core element preventing STI transmission and reducing undiagnosed HIV. A key output of this work was development of a new classification of sexual partner types to strengthen PN (145):

Partner types for clinical practice (Lustrum):

- established partner
- new partner
- occasional partner
- one-off partner
- sex worker

The new classification system can assist sexual health professionals in understanding the likelihood of sex reoccurring between index patients and their sex partners.

In 2022, NICE put forward a list of recommendations (133) around PN that was informed by an evidence review on PN methods to prevent or reduce STIs (141).

# 7. Alert, detect and respond

## Exceedance detection and monitoring

An exceedance is when the rate or number of infections is higher than the expected background level, taking into account seasonal trends and patterns over previous years.

The primary objective of outbreak identification and management is to protect public health by identifying the source of an infection and implementing control measures to prevent further spread and recurrence. Early identification and intervention are crucial for successful control for all outbreaks. However, STI outbreaks are particularly challenging because they may remain undetected for several months.

Identifying and responding to STI outbreaks requires a multidisciplinary approach including surveillance, PN, clinical management of cases, infection prevention and control measures, which may involve some or all of vaccination, effective communication, and outreach to affected communities. The response is often complex and involves a range of different stakeholders across the public health system.

## STI outbreak management

The management of STI outbreaks may take longer than outbreaks of other infectious diseases owing to these challenges; sustained and targeted behaviour change is likely required in dense sexual networks to break the chains of transmission.

Updated guidance from UKHSA contains the steps for investigating and managing outbreaks of STIs.

The PHE guidance Managing outbreaks of sexually transmitted infections operational guidance (2017) includes infection specific considerations and a list of past outbreak investigations.

## UKHSA's STI surveillance systems

The GUMCAD STI Surveillance System collects data on all STI tests, diagnoses and services at all publicly commissioned SHSs in England. It is an electronic, pseudonymised patient-level data set reported by over 200 services. UKHSA coordinates and manages the data collection, processing, storage, analysis, and reporting of GUMCAD data.

The CTAD Chlamydia Surveillance System collects data on all publicly commissioned chlamydia tests in all settings.

Trends on STI testing and diagnoses are published annually as official statistics: Sexually transmitted infections (STIs): annual report and data tables.

Please see the guide to the local and national data, produced from these surveillance systems.

# Overview of cost effectiveness tools

In 2020, the PHE Health Economics team published a Sexual and reproductive health: return on investment tool to inform the commissioning of sexual and reproductive health services for young people (aged 15 to 24 years) that quantifies the costs and benefits associated with a range of sexual and reproductive health interventions.

It allows users to estimate the impact commissioning different services would have on population health and cost savings for local authorities, the NHS and wider government. The tool can be set to focus on the national level or in users' local area (region, local authority or clinical commissioning group).

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# Abbreviations

| Abbreviations | Meaning |
|---|---|
| 4CMenB | 4-component recombinant protein–based |
| APT | Accelerated Partner Therapy |
| AIDS | acquired immune deficiency syndrome |
| AMR | antimicrobial resistance |
| AVAC | Advocacy Access Equity |
| BASHH | British Association of Sexual Health and HIV |
| BHIVA | British HIV Association |
| CDS | condom distribution schemes |
| DGI | disseminated gonococcal infection |
| DHSC | Department of Health and Social Care |
| dPEP | doxycycline post exposure prophylaxis |
| EPT | Expedited Partner Therapy |
| FDA | Food and Drug Administration |
| FSRH | Faculty of Sexual and Reproductive Healthcare |
| GBMSM | gay, bisexual and other men who have sex with men |
| GRASP | Gonococcal Resistance to Antimicrobials Programme |
| HI-MSM | heterosexual-identifying men who have sex with men |
| HIS-UK | home-based intervention study |
| HIV | human immunodeficiency virus |
| HPV | human papillomavirus |
| HSV | Herpes Simplex Virus |
| IDPS | infectious diseases in pregnancy screening |
| IMD | Index of Multiple Deprivation |
| JCVI | Joint Committee on vaccination and immunisation |
| JORRP | juvenile onset recurrent respiratory papillomatosis |
| LGBT | lesbian, gay, bisexual, and transgender |
| LGBT+ | lesbian, gay, bisexual, transgender and other sexual and gender identities |
| LGV | lymphogranuloma venereum |
| MARS | *Mycoplasma genitalium* AMR surveillance |
| MDR | multidrug resistant |

| Abbreviations | Meaning |
|---|---|
| MVA-BN | The Modified vaccinia Ankara–Bavarian Nordic |
| NAAT | nucleic acid amplification test(s) |
| NATSAL | National Survey of Sexual Attitudes and Lifestyles |
| NCSP | National Chlamydia Screening Programme |
| NGU | non-gonococcal urethritis |
| NHS | National Health Service |
| NICE | National Institute for Health and Care Excellence |
| NIHR | National Institute for Health and Care Research |
| ONS | Office for National Statistics |
| PHE | Public Health England |
| PID | pelvic inflammatory disease |
| PN | partner notification |
| POC | point-of-care |
| POCT(s) | point of care test(s) |
| POPI | Prevention of Pelvic Infection |
| PrEP | pre-exposure prophylaxis |
| RCOG | Royal College of Obstetricians and Gynaecologists |
| RiiSH | Reducing inequalities in Sexual Health |
| RSHE | Relationship, Sex and Health Education |
| SHS(s) | sexual health service(s) |
| Spp. | (as in *Shigella spp.*) species |
| STI | sexually transmitted infection |
| STIs | sexually transmitted infections |
| TFI | tubal factor infertility |
| TOC | test of cure |
| UKHSA | UK Health Security Agency |
| WHO | World Health Organization |
| XDR | extensively drug resistant |

# About the UK Health Security Agency

UKHSA is responsible for protecting every member of every community from the impact of infectious diseases, chemical, biological, radiological and nuclear incidents and other health threats. We provide intellectual, scientific and operational leadership at national and local level, as well as on the global stage, to make the nation health secure.

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