



Public Health
England

Protecting and improving the nation's health

Syphilis epidemiology in London

**Sustained high numbers of cases in men
who have sex with men**

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Executive summary

Syphilis is a sexually transmitted infection (STI) caused by the *Treponema pallidum* organism. Since the late 1990s, there has been a sustained increase in the numbers of syphilis cases in England. Several outbreaks have been reported across England, the majority among men who have sex with men (MSM) although smaller outbreaks among heterosexuals have also been reported.

London bears an increasingly disproportionate burden of syphilis cases. In 2015, 2,811 Londoners were diagnosed with syphilis, accounting for 56% of all cases in England (5,042).¹

- the rate of syphilis diagnoses in London in 2015 was over three times higher than the rate in England overall, and over five times higher than any other PHE centre.¹
- since 2010 the number of cases of syphilis in Londoners has increased by 163%, with a 22% increase in the year from 2014 to 2015.

Syphilis was diagnosed in residents of all London local authorities (LAs) in 2015, and most LAs saw an increase in syphilis cases.

- central London boroughs continue to have the highest numbers of cases.
- in 2015, London boroughs made up 18 out of the top 20 LAs in England with the highest rates of syphilis.¹
- 18 boroughs in London had more than 50 cases of syphilis in 2015 and the following had more than 100: Camden, Hackney, Haringey, Islington, Lambeth, Lewisham, Southwark, Tower Hamlets, Wandsworth, Westminster.

Men who have sex with men (MSM) in London are disproportionately affected by syphilis and this is worsening.

- in 2015, 2,406 syphilis cases were diagnosed in MSM in London.
- MSM accounted for 90% of syphilis cases in 2015.
- from 2010 to 2015, the number of syphilis diagnoses in MSM increased from 724 to 2,406 (232% increase), with an increase of 18% from 2014 to 2015 alone.
- in 2015, over half of MSM syphilis diagnoses were in individuals co-infected with HIV (51%), and 53% of MSM diagnosed with syphilis were diagnosed with another new STI during the same episode or within the previous year.
- the median age of MSM diagnosed with syphilis in 2015 was 36 years old, the majority were white (74%) and 44% were born in the UK.

Diagnoses of syphilis in heterosexuals in London have been stable though continue to be higher than we would like with effective preventive measures in place.

There is sustained transmission of HIV among MSM in London and also increases in a range of other infections transmitted sexually in this group. Evidence from recent outbreaks and rises in *Shigella* and lymphogranuloma venereum (LGV) in MSM

indicate that risky sexual behaviours are contributing to transmission. High-risk behaviours reported include sero-adaptive behaviour (ie choosing a partner based on HIV status), chemsex (sex under the influence of recreational drugs), high numbers of sexual partners, 'app' or venue facilitated sexual networks and condomless sex. Syphilis infection is a marker of high-risk sexual activity, and these risk behaviours are likely to be a factor in the observed, and adverse, increase in syphilis in London.

Action is needed to address the sustained high numbers of cases of syphilis in London, by focusing on preventing transmission in MSM. Early testing and treatment is essential, in addition to robust contact tracing and promotion of safer sex by both ensuring the ready availability of condoms and tackling the underlying drivers for not using condoms during sexual activity.

Implications for prevention

LA health and wellbeing boards are advised to identify which segments of their populations would benefit from targeted action to address the sexual health needs of MSM and act accordingly as outlined in the 2014 PHE report 'HIV and STIs in men who have sex with men'. This covers a range of measures required to stem transmission of STIs in MSM in general including tackling the underlying causes such as chemsex and other aspects of reducing substance misuse and raising awareness of the consequences of practices such as sero-adaptive behaviour.

In some cases a collaborative approach will be most appropriate and LAs should consider work with PHE to take action to increase MSM awareness of the following, especially among those who are HIV positive:

- the rise in syphilis in MSM
- the benefits of early testing and treatment
- the importance of participation in contact tracing

PHE should work through its relationships with professional bodies and with the NHS to ensure clinicians are aware of the increase in syphilis, and the different ways in which this may manifest in clinical settings.

PHE should work with providers of sexual health services to identify further risk factors for transmission, including particular venues or channels used by cases to meet sexual partners.

Commissioners of sexual health services are advised to ensure that contact tracing at services they commission is robust and that appropriate drug and alcohol services are available.

Providers of sexual health services should:

- offer sexual health screens including an HIV test annually to MSM, three monthly to MSM having unprotected sex with new or casual partners
- make the most of health promotion opportunities when a test result is negative
- optimise contact tracing including development and application of appropriate standards for contacts per case for syphilis diagnoses
- train staff to rapidly assess drug and alcohol use in clients, provide harm minimisation advice and promptly refer to appropriate services if indicated

PHE's messages for MSM

- have an HIV and STI screen at least annually and every three months if you are having unprotected anal intercourse with casual or new sexual partners
- always use a condom correctly and consistently until all partners have had a sexual health screen
- reduce the number of sexual partners and avoid overlapping sexual relationships
- unprotected sex with partners believed to be of the same HIV status (serosorting) is unsafe. For the HIV positive person, there is a high risk of acquiring other STIs and hepatitis. For the HIV negative person, there is a high risk of acquiring HIV infection as well as acquiring STIs and hepatitis
- ask your sexual health clinic where you can get support to reduce the likelihood of acquiring STIs and other adverse health outcomes associated with recreational drug use. People who inject drugs are advised to use a full set of clean equipment for each injecting episode and make use of resources on the Harm Reduction Works website to keep themselves safe and reduce health harms
http://www.harmreductionworks.org.uk/hep_c.html

Aim

The aim of this report is to update stakeholders on the epidemiology of syphilis in adults in London.

Context

Syphilis infection

Syphilis infection is caused by *Treponema pallidum*, a bacteria-like spirochete. Syphilis infection can result in a range of symptoms from painless ulcers and rash to central nervous system (CNS) disease and death. The incubation period for syphilis is usually three weeks but can range from ten days to three months.²

Primary syphilis infection presents as a painless papule or ulcer at the site of infection usually lasting for three to six weeks,³ followed by a secondary stage characterised by more widespread symptoms including malaise, fever, headache, swollen glands, night sweats and rash. Secondary symptoms usually resolve within weeks to months leading into a latent phase in which some symptoms may continue.^{2,4,5} Early latent syphilis refers to cases of latent syphilis where infection occurred in the last 12 months.³ In this report, infectious syphilis refers to primary, secondary and early latent infections.⁶

About a third of cases if untreated will progress to tertiary syphilis, characterised by serious and potentially fatal complications including CNS and cardiovascular complications and death. Tertiary syphilis is now rare due to the widespread use of penicillin and other antibiotics that *Treponema* is sensitive to.⁷ Congenital syphilis infection can lead to miscarriage, neonatal death, or congenital disorders including bone malformations and deafness.^{2,4,5} Co-infection with HIV may increase the likelihood of CNS disease and coincident syphilis infection also increases the likelihood of HIV transmission.

Humans are the only reservoir of *Treponema pallidum*, and transmission occurs primarily through sexual contact with an infected person; around a third of sexual contacts of an individual with active syphilis infection will contract the infection.⁶ Syphilis infection can also be transmitted from an infected pregnant woman to her developing baby, and rarely, through blood transfusion or other exposures. Syphilis can be transmitted while skin or mucous membrane lesions are present; this is most likely within the first year of infection. Congenital syphilis infection can be transmitted to the

developing baby throughout the course of latent infection, but is most common during early maternal infection.^{2,4}

The majority of infectious syphilis cases are diagnosed and managed in genitourinary medicine (GUM) clinics. This report will focus on cases of infectious syphilis diagnosed and reported by GUM clinics in London. Syphilis is diagnosed through clinical history and examination and laboratory testing. Laboratory diagnosis of those presenting for treatment is made through testing of lesions and more commonly through serological testing, while opportunistic screening of asymptomatic individuals relies on serological testing alone. Microscopy and PCR (Polymerase Chain Reaction) are the key testing mechanisms for samples from lesions. Serological antibody testing relies on confirmation from two sets of tests: non-treponemal and treponemal antibody tests.³

Epidemiology of syphilis

Diagnoses of infectious syphilis declined in England in the late 1980s and early 1990s in accordance with positive behavioural changes influenced by the HIV pandemic.⁸ However, since increasing in the late 1990s, syphilis diagnoses have remained at elevated levels and a series of outbreaks have been reported across England over this period.⁶ In the late 1990s and early 2000s, significant outbreaks involving from tens to hundreds of cases were reported in Bristol, Peterborough and North Cambridgeshire, Manchester, London, Brighton and Newcastle.⁹ Three further outbreaks were reported in 2012-2014 in the East of England and Yorkshire and Humber.⁶ There is sustained transmission of syphilis among the sexually active populations in London, Manchester and Brighton.⁶

Sustained syphilis transmission is a marker of continuing high risk sexual activity.¹⁰ The increased incidence of infectious syphilis since the epidemic began has disproportionately affected white MSM, largely in urban centres such as central London, Manchester and Brighton.⁸ However, although smaller in number, outbreaks and persistently increased numbers of diagnoses have also been reported in heterosexual men and women during the epidemic.⁶ Cases of congenital syphilis also continue to be identified in England.¹¹

Other STIs in MSM in London

MSM in London are disproportionately, and increasingly, affected by STIs.^{10,12} There have been recent increases in numbers of gonorrhoea (including azithromycin resistant gonorrhoea), lymphogranuloma venereum (LGV), HIV and *Shigella* cases in MSM in London. The burden of STIs is greatest among HIV positive MSM.

The sustained transmission of these infections in MSM may be explained by reported risky sexual behaviours. For example, in recent *Shigella* and LGV outbreaks in London,

risk taking behaviours reported included higher numbers of sexual partners, sero-adaptive behaviours (ie choosing a partner based on HIV status), chemsex (sex under the influence of recreational drugs) and injecting drug use, meeting sexual partners through social networking applications and sex venues and condomless sex.^{11,12}

Syphilis prevention and control

STI outbreak control and the management of syphilis cases follows the principles outlined in HPA (Health Protection Authority, now PHE) and BASHH (British Association for Sexual Health and HIV) guidelines, with a focus on the following.^{7, 13}

- surveillance and intelligence capture
- early testing and treatment of cases
- robust contact tracing
- health promotion to modify sexual risk behaviour, e.g. condom use
- continued monitoring and evaluation

A recent review (2015) conducted by the European Centre for Disease Prevention and Control (ECDC) presented evidence for interventions to prevent HIV and STIs among MSM. Evidence-based effective interventions¹⁴ identified included:

- promotion of condom use and provision of easily accessible condoms
- accessible HIV and STI testing through a variety of modalities including partner referral
- timely treatment for HIV and other STIs
- provision of accurate and accessible health promotion information
- MSM-competent health services, involving the target group, and including comprehensive services across the entire care pathway (eg health promotion, counselling, peer support, prevention, diagnostics and treatment)

The review also emphasised the gaps in information that exist in evaluation of interventions targeting STIs in MSM. These gaps apply to syphilis as well. For example, interventions in the areas of awareness raising, mass treatment and new partner tracing approaches have had varied success.⁹ However, more extensive intelligence is needed around risk factors for transmission and effective prevention and control interventions, particularly on a local level.

Data sources

The GUMCAD surveillance system was the only data source used to produce this report. GUMCAD superseded a system of quarterly KC60 returns from GUM clinics in 2009. Between 1999 and 2002 respectively, there were two additional systems, the National Enhanced Syphilis Surveillance (NESS) and Local Enhanced Syphilis Surveillance (LESS) in London.¹⁵ However, this data is no longer being collected.

GUMCAD is a single record level reporting system that collects information about attendances and diagnoses at genitourinary (GUM) clinics. Multiple attendances at the same clinic by the same patients can be identified although it is not possible to link attendances at different clinics. Limited information about the patient's area of residence is collected along with demographic data and other variables.

Syphilis cases included for analysis were A1 (primary syphilis), A2 (secondary syphilis), and A3 (early latent syphilis) as coded by clinic staff in GUMCAD reporting.

The data extract used for this report was provided in June 2016. Further information on GUMCAD is available on the PHE website.¹⁶

Mid-2014 ONS population estimates have been used for calculating 2015 rates.

Epidemiology

Syphilis burden in London

London has a high burden of syphilis cases. 56% of syphilis cases reported in England in 2015 were in London (2,811 cases) and rates of syphilis have increased over the past five years (2010 to 2015) in 32 of 33 London boroughs. MSM are disproportionately affected with 90% of new diagnoses, despite comprising only about 2% of the London adult population.¹⁰

In 2015, 2,811 syphilis cases were diagnosed in London residents. This represents a rate of 32.9 per 100,000 residents. The rate is over three times higher than the rate in England overall (9.3) and over five times higher than any other PHE centre (Figure 1).

Figure 1: Syphilis rate per 100,000 population by public health centre (PHEC) of residence: England 2015. Data source: GUMCAD



Trend in London

The number of syphilis cases in London is rising fast. There has been an increase of 163.4% in syphilis cases in Londoners since 2010 (1,067 cases) and an increase of 21.9% since 2014 (2,306 cases) (Figure 2). This rise has been most marked in MSM (Figure 3).

Figure 2: Syphilis diagnoses by year in London residents, 2010-2015.
Data source: GUMCAD

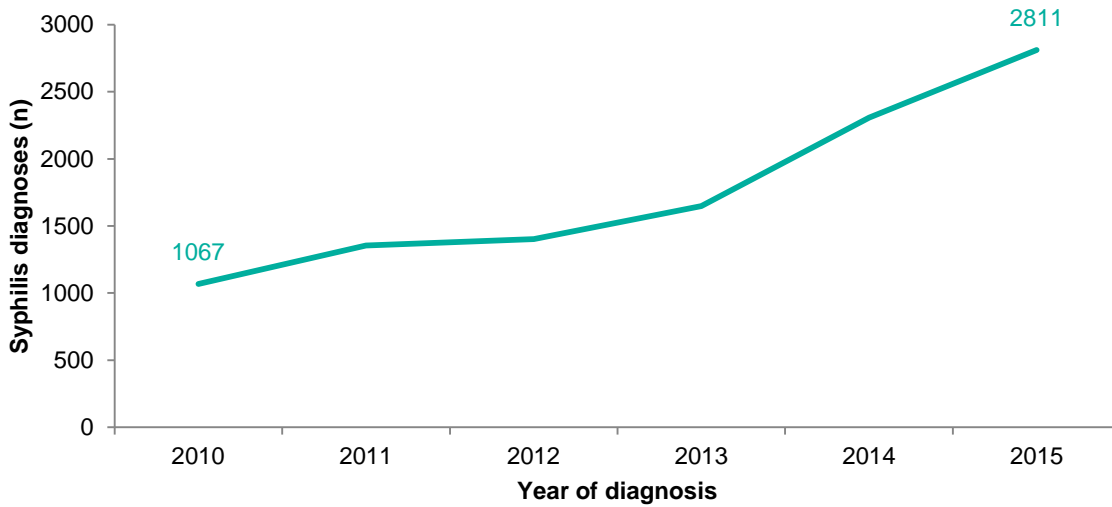
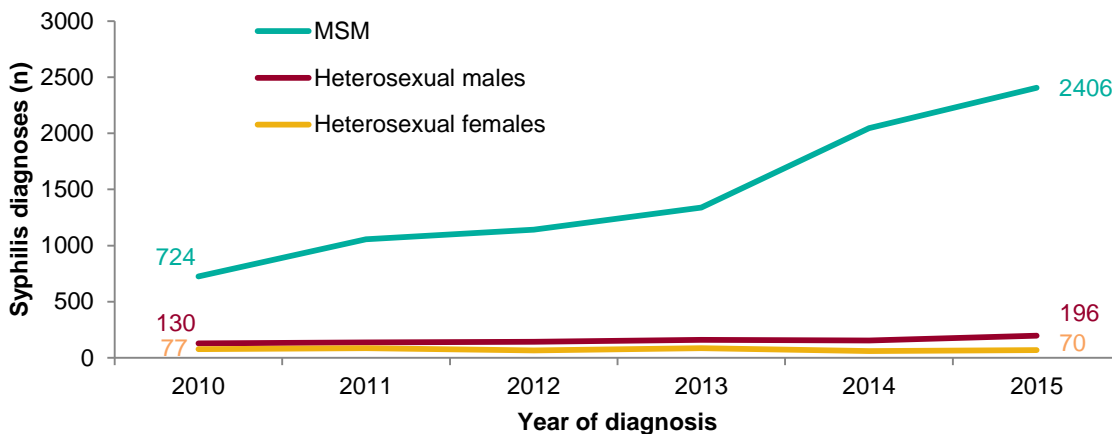


Figure 3: Number of syphilis diagnoses in MSM, heterosexual males and heterosexual females, London residents, 2010-2015. Data source: GUMCAD

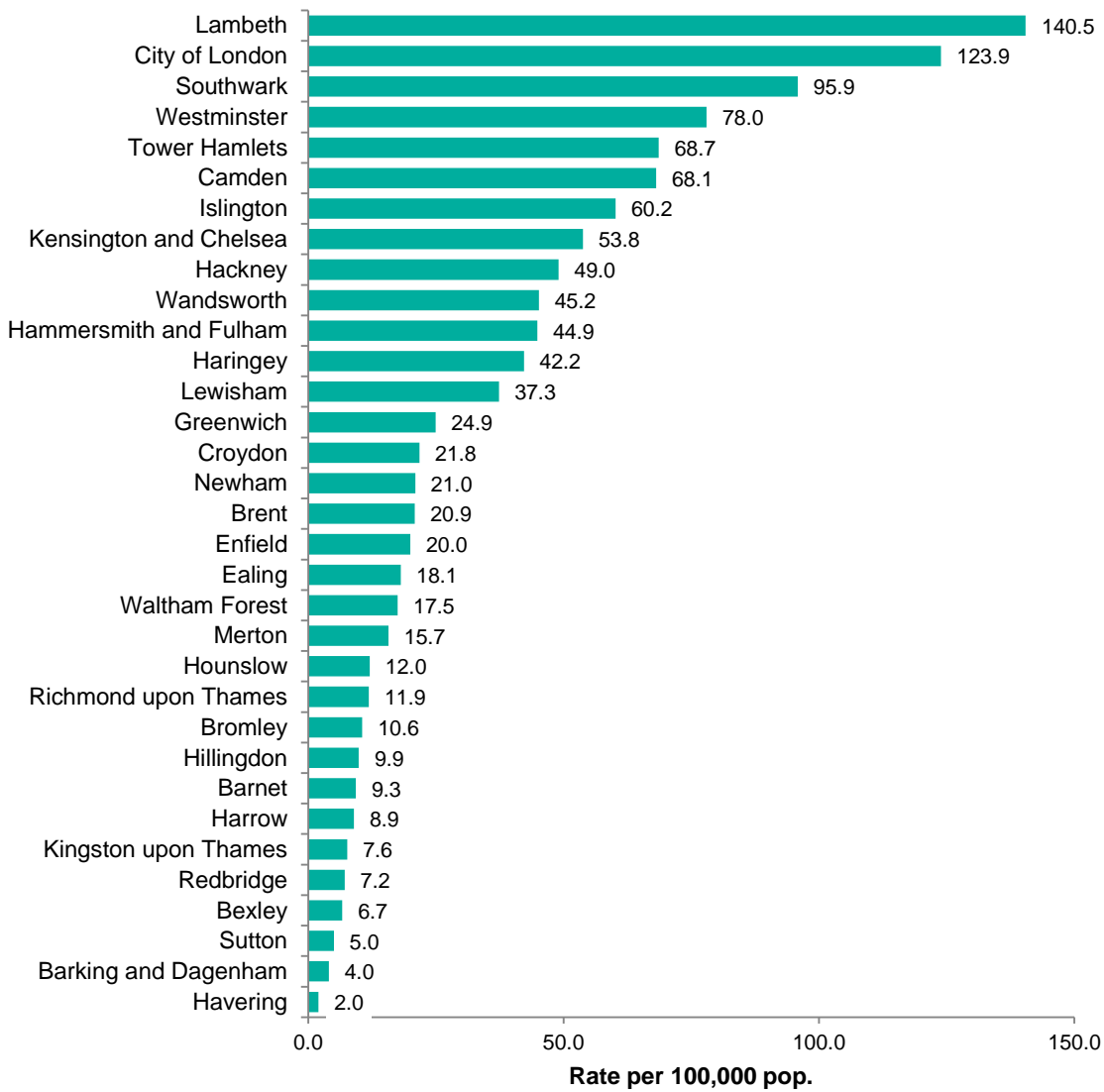


Burden by local authority

There is marked variation in the rate and number of cases of syphilis by local authority. The rate in Lambeth (140.5 per 100,000) is approximately 70 times higher than in Havering (2 per 100,000) (Figure 4) (Appendix).

Figure 4: Syphilis rates per 100,000 population by local authority of residence in London, 2015.**

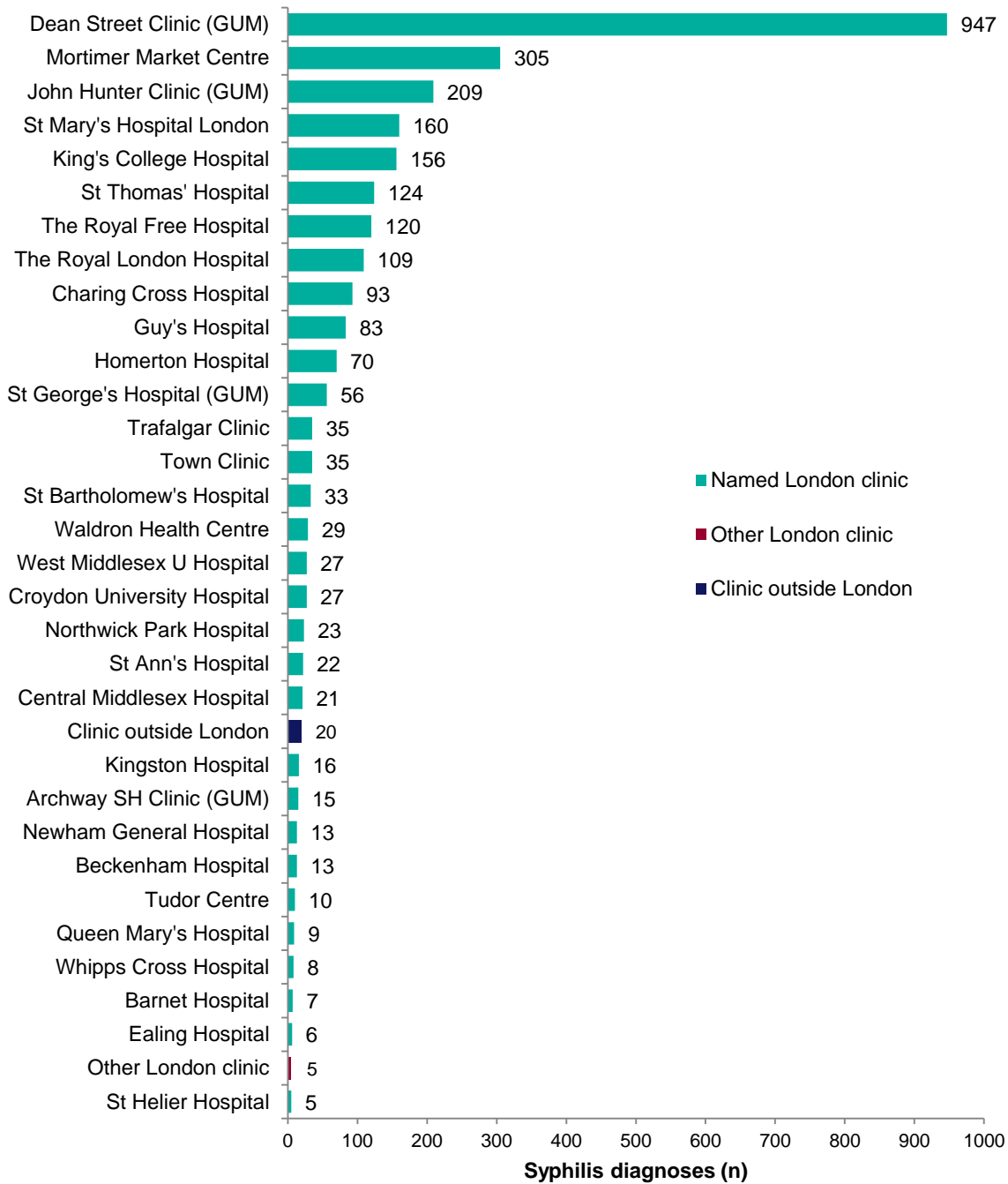
Data source: GUMCAD



** In local authorities with small numbers of cases/populations eg City of London, rate estimates are less precise and therefore have larger confidence intervals

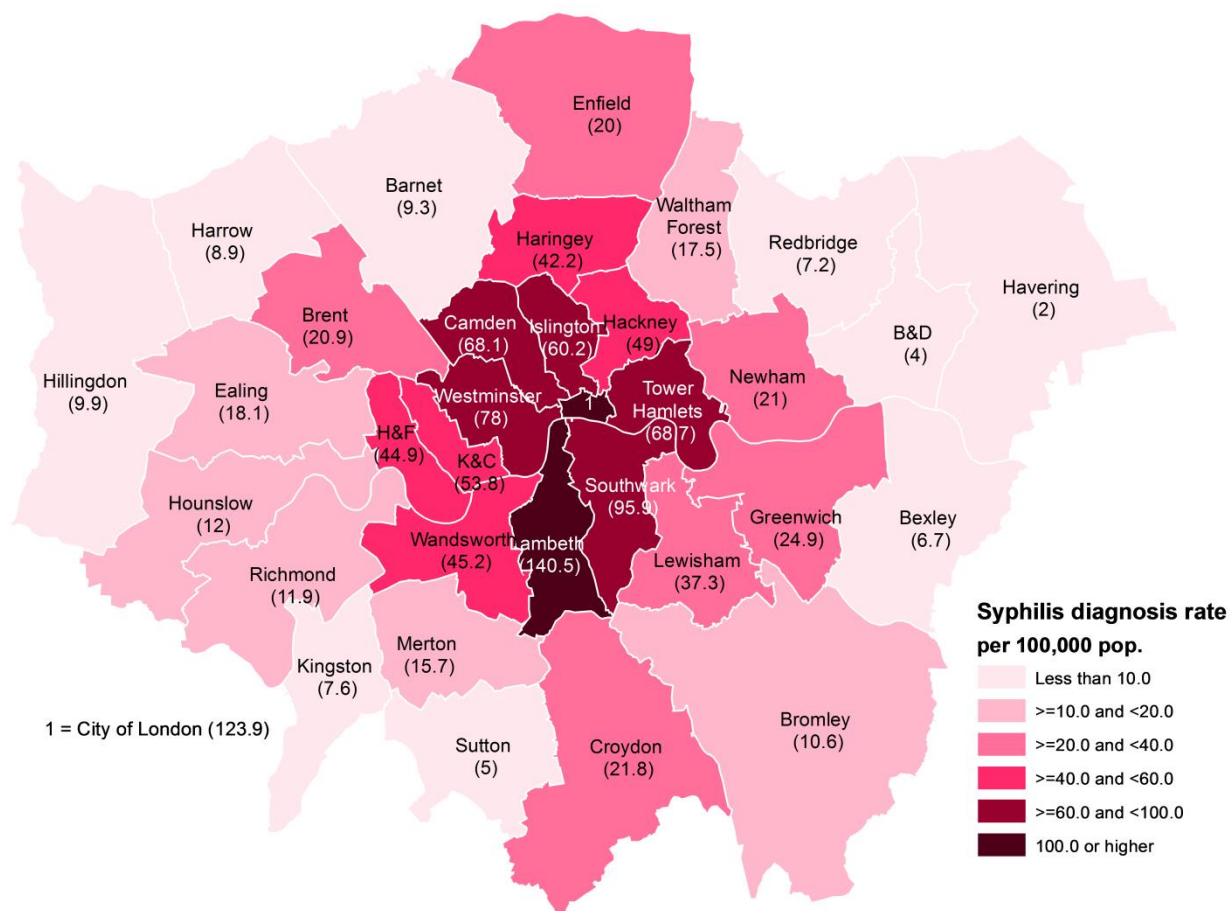
Ten London LAs had more than 100 diagnoses of syphilis among their residents in 2015: Camden, Hackney, Haringey, Islington, Lambeth, Lewisham, Southwark, Tower Hamlets, Wandsworth, Westminster. This can be compared to the locations of clinics where diagnoses were made (Figure 5).

Figure 5: Numbers of syphilis diagnoses by GUM clinic of diagnosis, London residents, 2015. Data source: GUMCAD



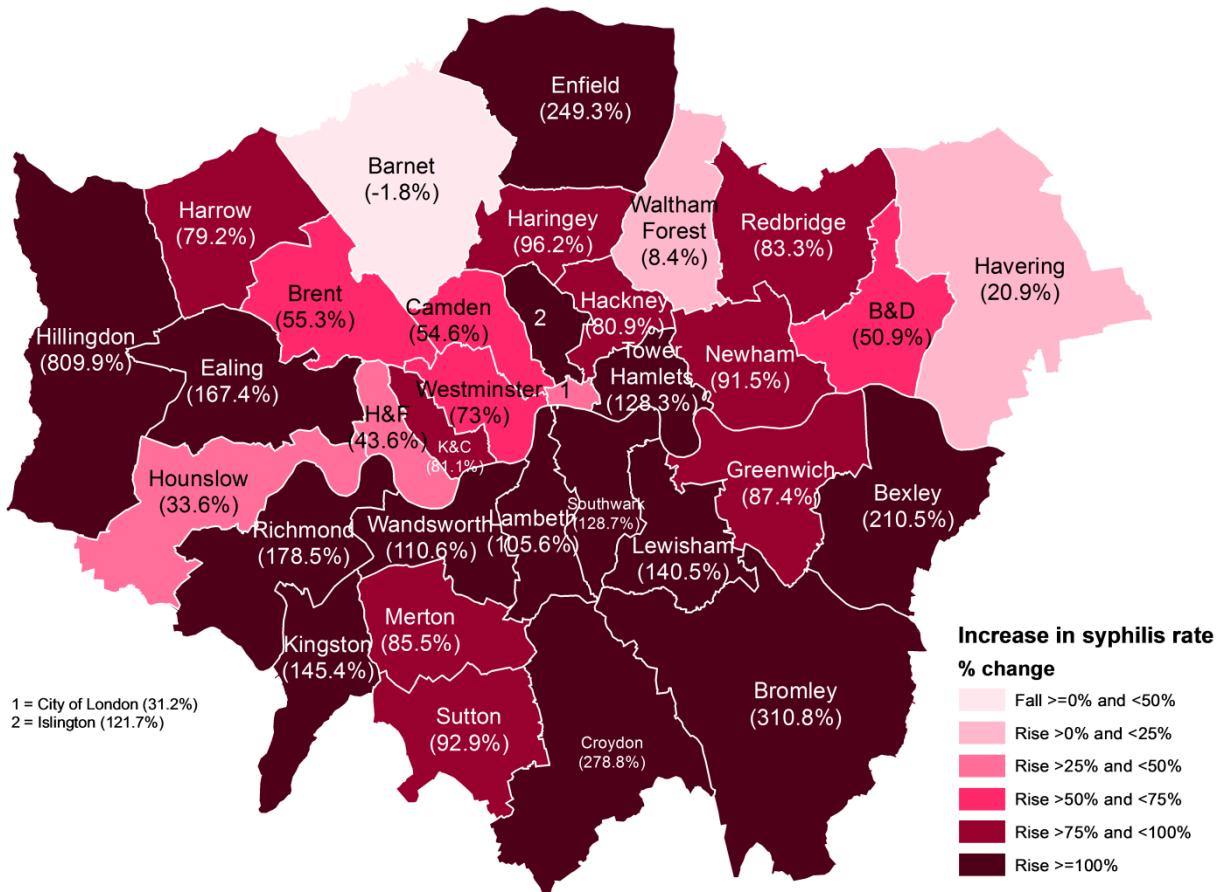
The highest rates of syphilis were reported in central London authorities (LAs) (Figure 6), although rates of syphilis have risen across most London authorities over the last five years (32 of 33) (Figure 7). The syphilis rate per 100,000 population for inner London was 63.1 compared to 13.0 in outer London

Figure 6: Map of syphilis rates per 100,000 residents by local authority in London, 2015.
Data source: GUMCAD



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Figure 7: Map of percentage increase in rates of syphilis per 100,000 residents by local authority in London, from 2011 to 2015. Data source: GUMCAD



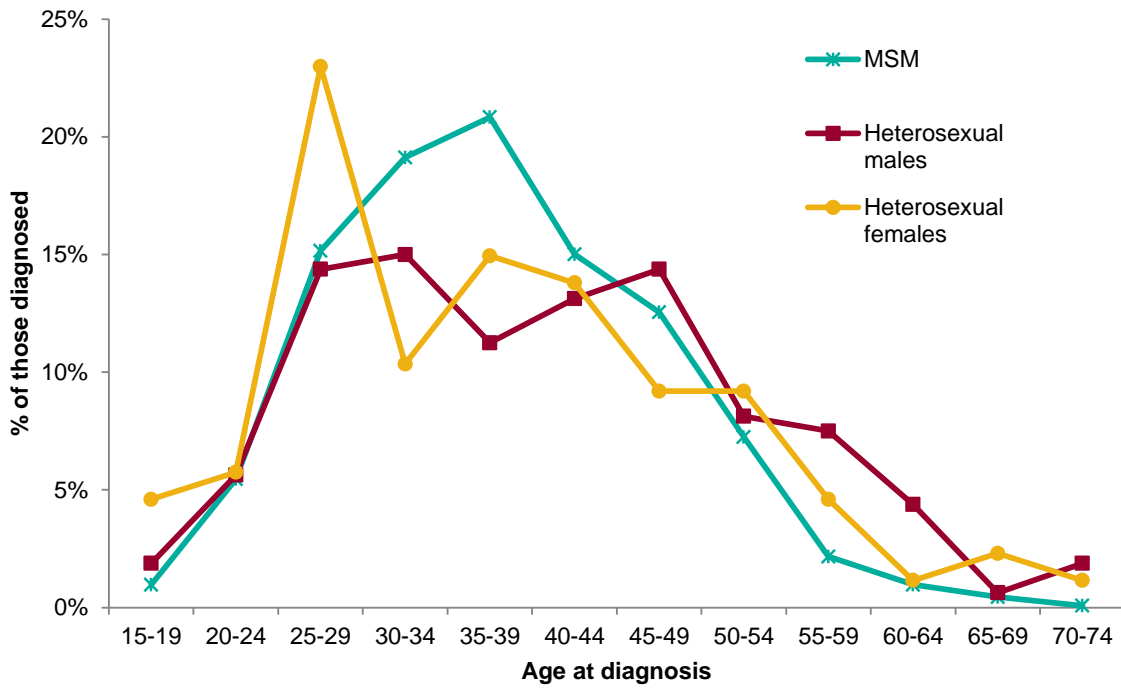
Age, sex and sexual orientation

The majority of syphilis cases in London are diagnosed in men who have sex with men (MSM) in central London, with a slightly older age profile than the profile for STIs overall in London.² Almost all cases of syphilis (96.5%) diagnosed in 2015 were male, with 89.9% diagnosed in MSM.

The median age of MSM cases (36 years) was lower than heterosexual male (38 years) and higher than heterosexual female cases (31 years) (Figure 8).

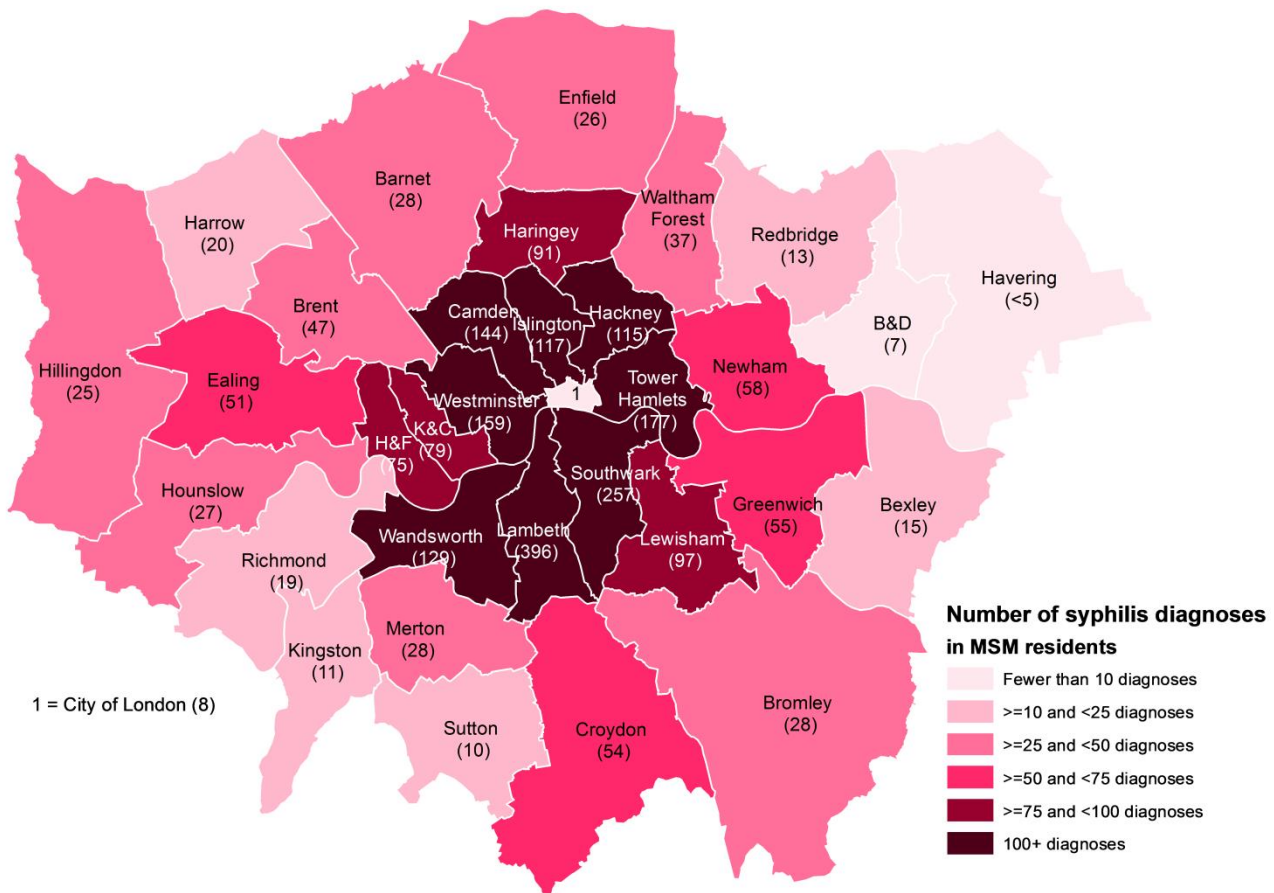
There were no cases of syphilis in children below 15 years of age or cases of congenital syphilis in 2015 in London.

Figure 8: MSM, heterosexual males and heterosexual females diagnosed with syphilis, age distributions compared: London residents, 2015. Data source: GUMCAD



The vast majority of cases of syphilis in London in 2015 were diagnosed in MSM (89.9%), in residents of central London local authorities (Figure 9).

Figure 9: Map of the number of syphilis diagnoses in MSM by local authority, London residents, 2015. Data source: GUMCAD

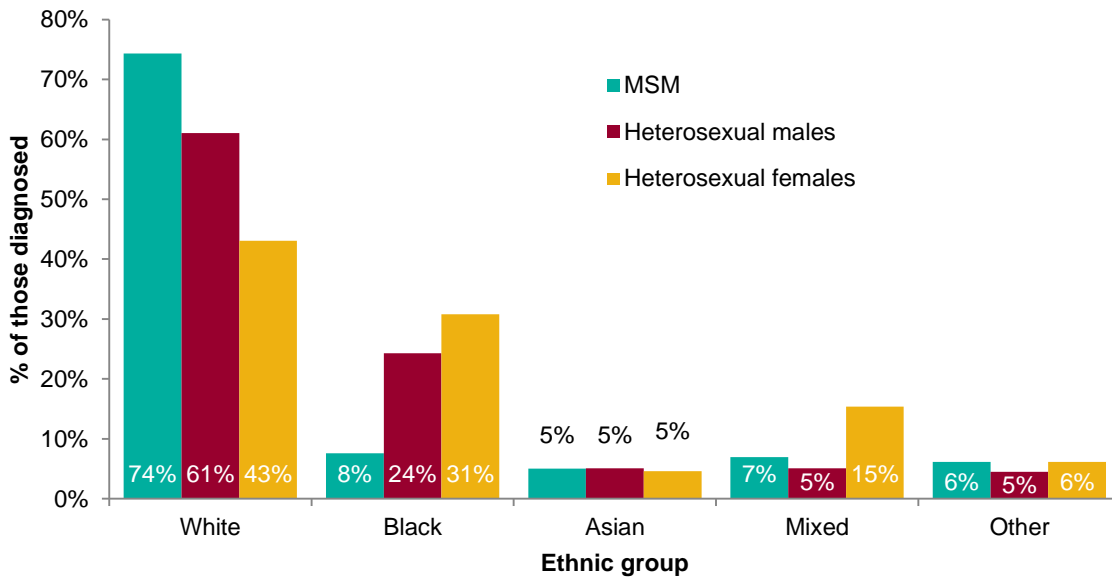


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Ethnicity

Among MSM and heterosexual males, most syphilis diagnoses were in white men. However, black men and women were over-represented as a proportion of heterosexual cases (Figure 10). There was a high proportion of cases in white MSM (74%) compared to white heterosexual males (61%). Syphilis cases in heterosexual females were disproportionately concentrated in black (31%) and mixed (15%) ethnicity women.

Figure 10: MSM, male heterosexuals and female heterosexuals diagnosed with syphilis in London by ethnicity, 2015. Data source: GUMCAD



Region and country of birth

Less than half of all syphilis cases in London in 2015 were in those born in the UK. In MSM and heterosexual males, the primary regions of birth of cases were in the UK and the rest of Europe. The pattern in heterosexual females was more varied (Figure 11). From 2012 to 2015, the highest number of syphilis cases in MSM were in those born in the UK, followed by Brazil, Italy and Spain (Figure 12).

Less than half of MSM (44%) and heterosexual males (47%) with syphilis diagnoses in 2015 were born in the UK and approximately one quarter (28% and 26% respectively) were born in the rest of Europe. In MSM, among the remaining cases Latin America/Caribbean-born was the highest represented in MSM cases (12%).

The pattern in heterosexual females was more varied with similar proportions born in the UK (25%), the rest of Europe (26%), Africa (20%) and Latin America/Caribbean (20%) (Figure 11).

Figure 11: Region of birth of MSM, heterosexual males and heterosexual females diagnosed with syphilis in London, 2015. Data source: GUMCAD

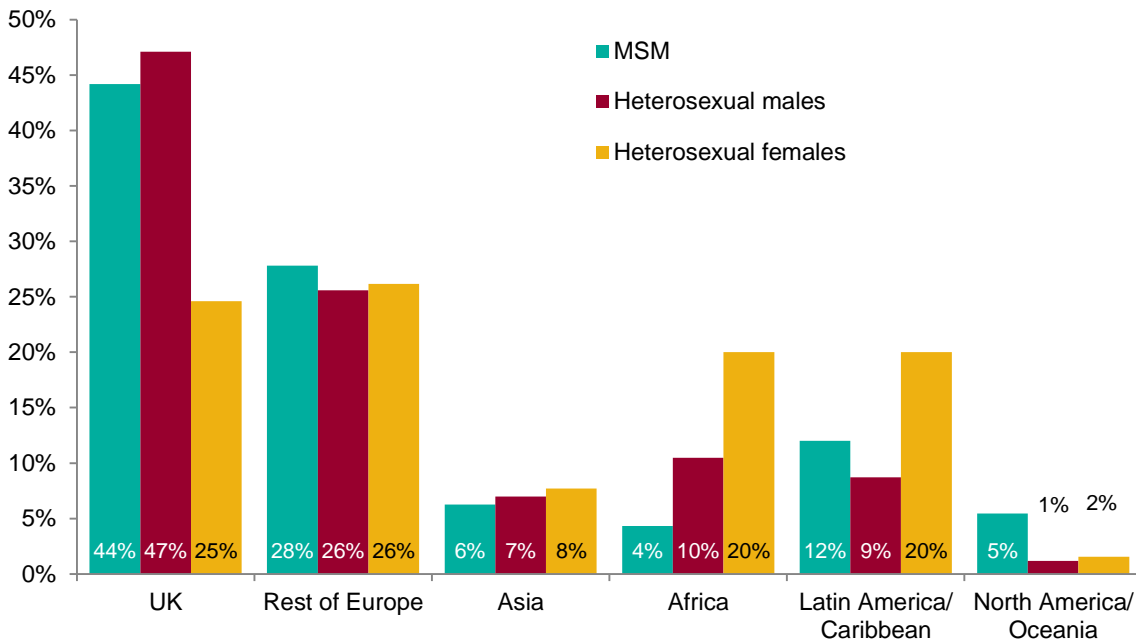
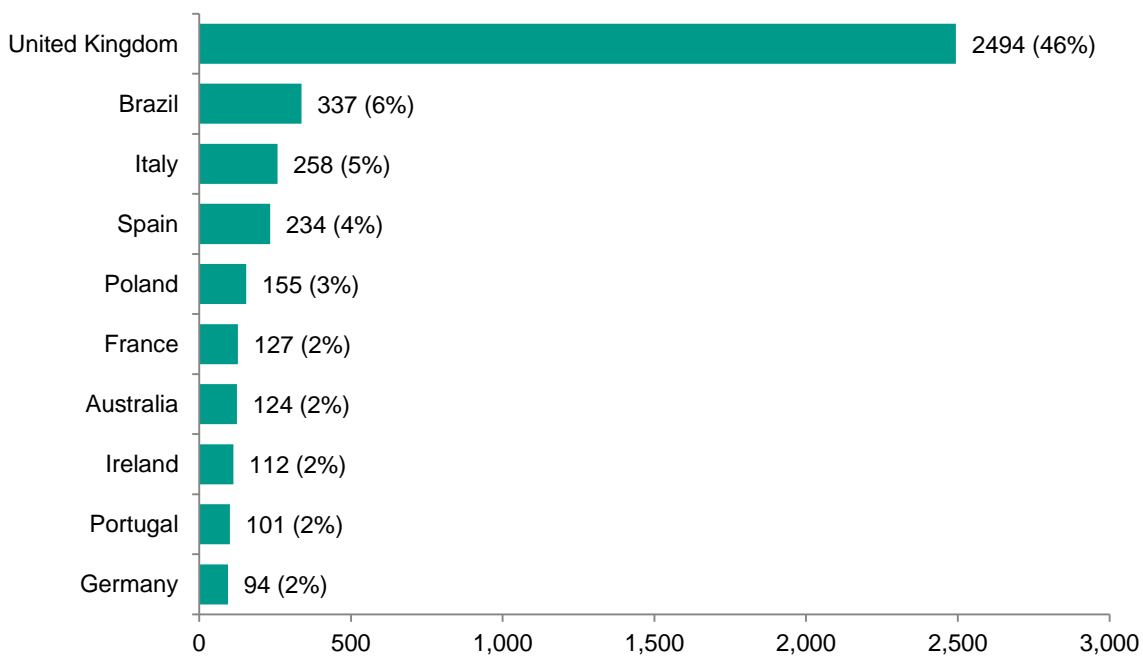


Figure 12: Country of birth of MSM diagnosed with syphilis (10 highest by number of cases), London residents, 2013-2015. Data source: GUMCAD



Co-infection with HIV and diagnoses of other new STIs

More than half of syphilis diagnoses in MSM in London (51%) were in individuals known to be HIV positive. More than half of MSM diagnosed with syphilis in London in 2015 were also diagnosed with another new STI in the same episode (defined as within the 42 days following the syphilis diagnosis) or preceding year.

Stage of infection

Cases of early latent infection have continued to account for a significant proportion of infections diagnosed. This suggests that potential opportunities for early diagnosis and treatment of cases are being missed.

In 2015, 32.8% of syphilis diagnoses were of primary syphilis, 27.7% were secondary and 39.5% were early latent. This compares to 2011 when 36.6% were primary, 32.8% were secondary and 30.6% were early latent. With 40% of MSM syphilis cases detected only at the early latent stage (Table 1), action to ensure earlier detection and treatment is still required.

As presented above, over one half of syphilis cases in MSM were in individuals known to be HIV positive. Within MSM primary syphilis cases, 42% were HIV positive while 54% of MSM early latent cases were HIV positive. This suggests that cases in MSM who are HIV positive are being diagnosed at a later stage.

Table 1: Stage of syphilis infection at diagnosis in MSM, heterosexual males and heterosexual females, London residents, 2015. Data source: GUMCAD

Risk group	Primary	Secondary	Early latent
MSM	32%	29%	40%
Heterosexual males	47%	29%	24%
Heterosexual females	44%	19%	37%

Partner Notification

There were 132 cases (5%) where the case was identified through partner notification.

Other information

There were 15 diagnoses where the patient was reported to be a sex worker. However, no diagnoses were reported in prisoners.

Discussion

Cases of syphilis in London have continued to increase over recent years and remain at high levels. Although cases are concentrated in central London boroughs, all London boroughs had cases diagnosed last year with an increase in cases seen across the majority of boroughs.

The burden of syphilis diagnoses in London is concentrated in MSM, primarily white MSM born in the UK and the rest of Europe in an older age group (median age 36 years). HIV positive MSM are particularly affected.

It is particularly concerning that this increase continues despite active campaigns to promote condom provision and use targeted towards MSM by Do it London, the pan-London HIV prevention programme, and in an area with a fully functioning sexual health care system where MSM have open access to testing and treatment.

Sustained syphilis transmission is a marker of high-risk behaviour. The high-risk sexual behaviours driving increases in other STIs in MSM are likely to be driving the increase in syphilis, including multiple and overlapping partners facilitated through the use of apps, sero-adaptive behaviour and chemsex, associated with high levels of condomless sex. The complex underlying factors that lead to condomless sex in MSM need to be tackled, although these are challenging.

Syphilis is a curable infection, and continued high proportions of early latent infections suggest earlier detection and treatment is both required, and possible to achieve. Robust and accessible services should be available for syphilis testing, treatment and contact tracing. Regular and frequent testing should be recommended and awareness increased of syphilis symptoms.

Given the significant proportions of MSM with syphilis diagnoses who are also HIV positive, this suggests that making the most of opportunities for prevention and testing at HIV treatment services should be encouraged.

Targeted health promotion with MSM is needed, including: awareness raising of syphilis infection symptoms and the risk of onward transmission; risk behaviour modification interventions, eg consistent condom use with all casual, new partners and main partners until they have been screened, reducing numbers of partners and avoiding overlapping partners; and that sero-sorting is unsafe.

Additional local data is needed on risk behaviours to understand the drivers of the epidemic and ensure prevention messages are accurately focussed, particularly information on how MSM are meeting partners.

There are multiple drivers of this continuing epidemic and action needs to be taken by the health system as a whole, with partners working together and supporting each other to deliver an effective response. This must bring together preventive action, raising awareness of the disease, improved diagnosis and earlier treatment with intervention at all parts of the care pathway. Services must be responsive to the target group(s) involved.

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Appendix

Number of syphilis cases and rates per 100,000 population by local authority of residence in London, 2015.** Data source: GUMCAD

Local Authority	Number of syphilis cases (n)	Syphilis rate per 100,000 population
Barking and Dagenham	8	4.0
Barnet	35	9.3
Bexley	16	6.7
Brent	67	20.9
Bromley	34	10.6
Camden	160	68.1
City of London	10	123.9
Croydon	82	21.8
Ealing	62	18.1
Enfield	65	20.0
Greenwich	67	24.9
Hackney	129	49.0
Hammersmith and Fulham	80	44.9
Haringey	113	42.2
Harrow	22	8.9
Havering	5	2.0
Hillingdon	29	9.9
Hounslow	32	12.0
Islington	133	60.2
Kensington and Chelsea	84	53.8
Kingston upon Thames	13	7.6
Lambeth	447	140.5
Lewisham	109	37.3
Merton	32	15.7
Newham	68	21.0
Redbridge	21	7.2
Richmond upon Thames	23	11.9
Southwark	290	95.9
Sutton	10	5.0
Tower Hamlets	195	68.7
Waltham Forest	47	17.5
Wandsworth	141	45.2
Westminster	182	78.0

** In local authorities with small numbers of cases/populations eg City of London, rate estimates are less precise and therefore have larger confidence intervals. Mid-2014 ONS population estimates have been used for calculating 2015 rates.

About Field Epidemiology services

The Field Epidemiology service (FES) supports Public Health England centres and partner organisations through the application of epidemiological methods to inform public health action.

FES does this in two main ways. Firstly by providing a flexible expert resource available, as and when needed, to undertake epidemiological investigations for key health protection work and secondly through the expert analysis, interpretation and dissemination of surveillance information to PHE Centres, local health partners, service providers and commissioners of services.

Within the FES network, excellence and innovation is encouraged. We foster academic collaborations and take active part and lead in research, development and training.

You can contact your local FES team at fes.seal@phe.gov.uk

If you have any comments or feedback regarding this report or the FES service, please contact fes.seal@phe.gov.uk