Public Health England

Protecting and improving the nation's health

Towards elimination of HIV transmission, AIDS and HIV-related deaths in the UK

About Public Health England

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Contents

One of 2 complementary reports about HIV in 2016[1]

[1] The 'HIV testing in England: 2017 report' can be found on the PHE webpages.

Key findings

Decline in new HIV diagnoses in gay and bisexual men

A decline in new HIV diagnoses among gay, bisexual and other men who have sex with men[2] has been observed for the first time since the epidemic was detected over 30 years ago (21% decline, from 3,570 in 2015 to 2,810 in 2016[3]). This decline was focussed in 5 London clinics, which delivered high levels of HIV testing, including frequent testing of men at high risk of HIV, together with accelerated initiation of anti-retroviral therapy (ART) at HIV diagnosis.

The observed decline in new diagnoses in gay and bisexual men is due to reduced transmission of HIV. The estimated annual number of new infections acquired in gay and bisexual men has declined year on year from a peak of around 2,800 (95% credible interval (CrI) 2,300 to 3,200) in 2012 to 1,700 (CrI 900 to 2,700) in 2016.

Decline in new HIV diagnoses in heterosexual men and women

There has been a continued decline in new HIV diagnoses among black African heterosexual men and women (4,060 in 2007 to 2,110 in 2016[3]). This decline is due to changing patterns of migration, with fewer people from high HIV prevalence countries coming to the UK. However, among white heterosexual women and men new HIV diagnoses have remained relatively stable but low at around 750 per year over the past decade.

Decline in late HIV diagnoses, AIDS and deaths

Over the past 10 years, the number of gay and bisexual men diagnosed late (CD4 count <350 cells/mm^3 within 91 days of diagnosis) has reduced by 25%, from 1,200 in 2007 to 900 in 2016. Steeper declines in late HIV diagnoses were observed in black African heterosexual men (by 74% from 700 to 170) and women (by 82% from 1,100 to 200). The number of white heterosexual adults diagnosed late has remained relatively stable at around 200 per year.

[2] Gay, bisexual and other men who have sex with men are hereafter referred to as gay and bisexual men; this group was previously referred to as men who have sex with men (MSM).
[3] Adjusted for missing exposure information and rounded.

The reported number of people diagnosed with AIDS has declined by 25% from 372 in 2015 to 278 in 2016.

For the first time, the overall mortality rate of people with diagnosed HIV aged 15 to 59 years who were diagnosed promptly was comparable to that of the general population of the same age group (mortality rate of 1.22 per 1,000 population compared to 1.39 per 1,000 population). However, people diagnosed late remain at high risk of death in the first year of diagnosis (26.1 per 1,000 population aged 15 to 59 years).

Towards elimination of HIV transmission, AIDS and HIV-related deaths

In London, in 2016 for the first time, all the UNAIDS 90:90:90 targets (1) have been met with 90% of people living with HIV infection diagnosed, 97% of people diagnosed receiving treatment and 97% of people receiving treatment being virally suppressed. The equivalent figures for the whole of England were 88%, 96% and 97% respectively.

The estimated number of people with undiagnosed HIV infection has reduced from 13,300 (CrI 10,600 to 18,200) in 2015 to 10,400 (CrI 8,400 to 15,700) in 2016, with most of the decline apparent in gay and bisexual men in London, and black African heterosexual women.

The time from HIV diagnosis to starting ART has reduced; in 2016, 76% of people newly diagnosed started ART within 90 days, compared to 33% in 2007. This is largely due to early start of treatment for persons diagnosed at higher CD4 count; 74% of people newly diagnosed with a CD4 count ≥350 cells/mm^3 started ART within 3 months. However, there is substantial variation between clinics.

Living with diagnosed HIV infection

People living with diagnosed HIV infection are growing older due to low mortality rates. In 2016, more than a third (38%; 34,735/91,987) of people accessing HIV care were aged 50 years and above, compared with 17% (9,768/55,923) in 2007.

Although HIV continues to disproportionately affect white gay and bisexual men and black African heterosexuals, the population of people living with diagnosed HIV infection is diversifying. In 2016, one in seven gay and bisexual men living with HIV were from black, Asian or other minority ethnic (BAME) groups; among heterosexual men and women one in four were white.

Public health recommendations

With progressive strengthening of combination prevention (including condom use, expanded HIV testing, prompt ART and availability of pre-exposure prophylaxis (PrEP)), HIV transmission AIDS and HIV-related deaths could be eliminated in the UK. The recent encouraging changes are dependent upon sustained prevention efforts. The inconsistencies between groups and geographies demonstrate that combination prevention needs to be replicated for all those at risk of acquiring of HIV, whoever they are and wherever they live.

The HIV PrEP Impact Trial[4] is a new component of PHE's HIV Prevention Programme. Beginning in October 2017, the 3-year trial[5] of 10,000 participants will address outstanding questions on PrEP need, uptake and duration of use in those at high risk of HIV acquisition in England. Almost 200 sexual health clinics are being recruited as trial sites with 1,000 participants receiving PrEP by early November 2017.

A new policy of immediate ART at HIV diagnosis is currently being considered by NHS England which would complement current Treatment as Prevention (TasP) policy. Swift implementation would ensure all people diagnosed with HIV achieve untransmissible levels of HIV.

As people with HIV continue to age, it is critical that HIV and other services continue to evolve to meet the needs of people living with HIV including the management of comorbidities and other complex health conditions.

[4] A non-interventional pragmatic health technology assessment announced in December 2016 (https://www.england.nhs.uk/2016/12/hiv-prevention-pregramme/).
[5] The trial is being funded by NHS England and sponsored by St Stephen's Clinical Research, who are working in close collaboration with PHE (https://www.prepimpacttrial.org.uk/).

How to get an HIV test:

- go to an sexual health clinic or a community testing site (www.aidsmap.com/hiv-test-finder)
- ask your GP for an HIV test
- request a self-sampling kit online (www.freetesting.hiv) or obtain a self-testing kit

Everybody who is offered an HIV test by their healthcare professional is advised to accept the test so that if an HIV diagnosis is made, effective treatment can be started.

Gay, bisexual and other men

Gay, bisexual and other men who have sex with men are advised to test for HIV and other STIs at least annually and every 3 months if having sex without condoms with new or casual partners.

Black African men and women

Black African men and women are advised to have an HIV test and a regular HIV and STI screen if having sex without condoms with new or casual partners.

Towards elimination of HIV transmission, AIDS and HIV-related deaths in the UK

In early 2017, certain sexual health services in London reported a decrease in new HIV diagnoses among gay, bisexual and other men who have sex with men (2). In this report, we confirm that, for the first time since the beginning of the UK epidemic, the number of HIV diagnoses in gay and bisexual men has fallen. The UK is one of the first countries to witness a substantial decline in HIV diagnoses in gay and bisexual men (3); this is the most significant development in the UK HIV epidemic in 20 years, since effective ART became widely available.

This decline adds to the evidence that combination prevention is working. The decline is driven by considerable increases in the numbers of both first and repeat HIV tests among gay and bisexual men, coupled with earlier initiation of ART following HIV diagnosis (2) together with high levels of condom use and increasing availability of PrEP. The PrEP Impact Trial over the next 3 years (4) is likely to contribute additional power to curtail the HIV epidemic.

HIV testing, including frequent testing among those most at risk of HIV, reduces the number of people unaware of HIV infection, the time with which people live with undiagnosed infection and provides the opportunity for prompt HIV treatment. ART is now so effective that those who are treated and have an undetectable viral load (<200 copies) have levels of virus that are untransmissible, even if having sex without condoms. This is sometimes referred to as U=U (undetectable= untransmissible).

Despite these promising data, significant challenges remain. The number and proportion of diagnoses made at a late stage of HIV infection remain high, particularly among heterosexual men and women. Late diagnosis is associated both with a higher risk of short-term mortality and morbidity as well as risk of onward transmission; people diagnosed late have typically been unaware of their HIV infection for 3 to 5 years. For heterosexual men and women, further expansion of HIV testing in line with NICE guidelines (5) will help bring down AIDS and HIV-related deaths further.

There is the potential to eliminate HIV transmission, AIDS and HIV-related deaths if the success of combination prevention achieved in gay and bisexual men in London is replicated across all settings and populations. This report is in 3 parts. Part 1 provides a description of the decline in HIV diagnoses in gay and bisexual men and in heterosexual men and women. Part 2 provides a summary of the progress that has been made through combination prevention towards eliminating HIV transmission, AIDS and HIV-related deaths in all populations in the UK. Part 3 provides a summary of the changing characteristics of people living with diagnosed HIV infection.

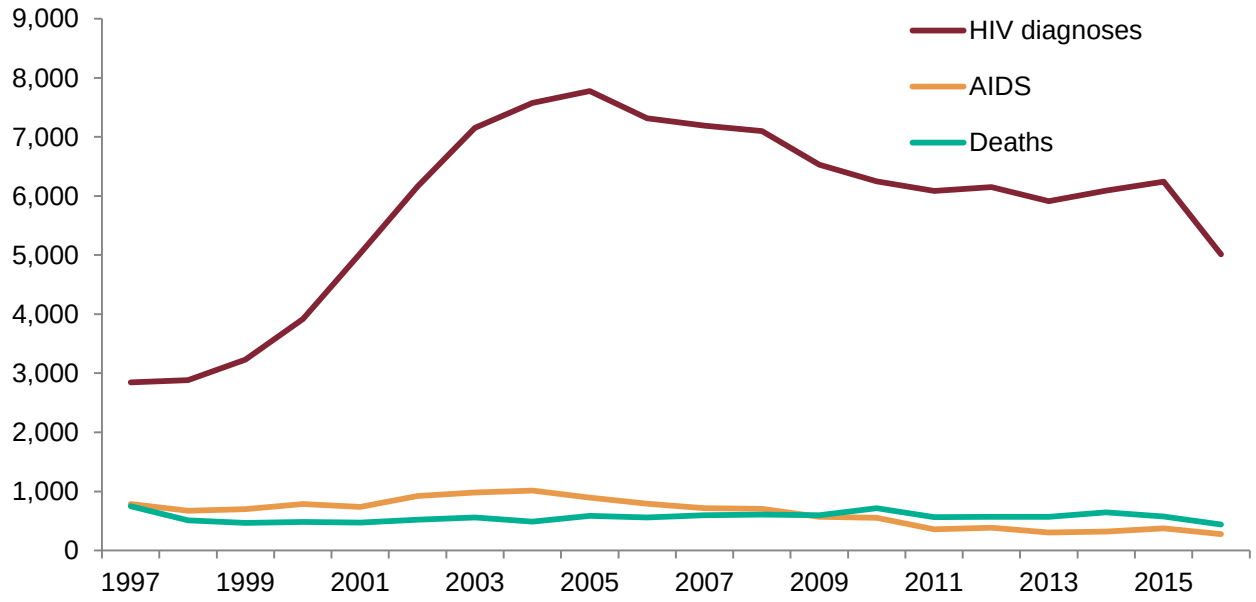
Part 1: HIV diagnoses and transmission, late HIV diagnoses, AIDS and deaths

New HIV diagnoses in the UK

In 2016, 5,164 people were newly diagnosed with HIV in the UK (3,938 men and 1,226 women), with 278 cases of AIDS and 442 deaths (Figure 1). Half of the diagnoses (54%, 2,810/5,164)[6] were reported among gay and bisexual and other men who have sex with men[7], with 19% (970) and 22% (1,140) of diagnoses reported among heterosexual men and women respectively. There were 130 diagnoses among people who inject drugs (PWID) and 41 who acquired infection through mother-to-child transmission (MTCT), with the remainder acquired through other exposure routes.

The 5,164 HIV diagnoses in 2016 represent an 18% decline on the 6,286 diagnoses in 2015. This decline is due to a sharp decrease in diagnoses among gay and bisexual men in London, and a continued gradual decline in diagnoses in heterosexual men and women born abroad.

Figure 1: HIV diagnoses, AIDS and deaths: UK, 1997 to 2016



[6] Data rounded after adjustment for missing information.
[7] This group was previously referred to as men who have sex with men (MSM).

London continues to account for the largest proportion of HIV diagnoses in the UK (40%, 2,090/5,164), with the Midlands and East of England region contributing the largest proportion of new diagnoses outside of London (19%; 987). Most people (70%, 3,620/5,164) newly diagnosed in 2016 were aged between 25 and 49 years. However, the number and proportion of people diagnosed at age 50 years or over has increased from 9.6% (701/7,277) in 2007 to 19% (971/5,164) in 2016.

In 2016, 18% (915) of the 5,164 people diagnosed with HIV in the UK were reported as having had a previous HIV diagnosis abroad. There was no difference in the proportion previously diagnosed abroad between gay and bisexual men and heterosexual men and women. Among those born and previously diagnosed abroad, 20% did not access care within 1 year of arrival in the UK and 40% had a CD4 count <350 cells/mm^3 at the time of diagnosis in a UK setting. Further work is needed to ensure people previously diagnosed with HIV abroad are accessing HIV care promptly after arrival in the UK; such individuals may be at risk from mortality and morbidity due to not accessing HIV care services.

HIV diagnoses and incidence in gay and bisexual men

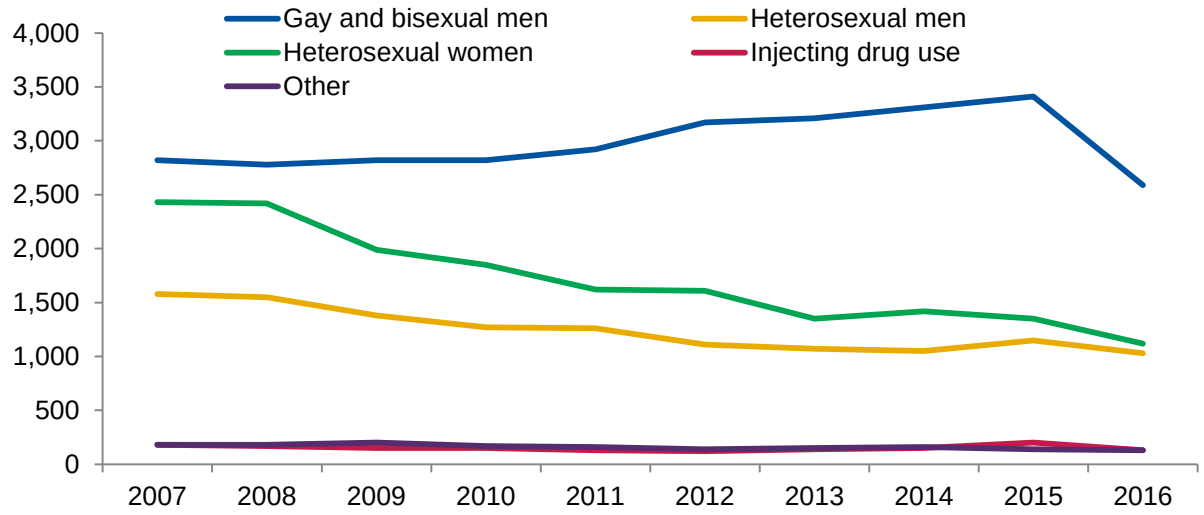
The number of new HIV diagnoses reported among gay and bisexual men decreased by 21% to 2,810 in 2016[8] (Figure 2). This contrasts to the steady increase observed from 2,850 in 2007 to 3,570 in 2015. The decline from 2015 to 2016 is not attributable to reporting delay and has been verified by cross checking data systems and follow-up with the reporting clinics.

In 2016, diagnoses made in London accounted for almost half (46%, 1,096/2,398) of the new HIV diagnoses in gay and bisexual men in England. Outside of London, the PHE centres with highest numbers of diagnoses were the North West (268) and the South East (233).

Almost three-quarters of gay and bisexual men newly diagnosed in 2016 were aged 25 to 49 years with a median age at diagnosis of 34 years (inter-quartile range (IQR) 27 to 43); this has not changed substantially over the past 10 years and was the same for those diagnosed in London and elsewhere.

[8] Adjusted for missing exposure information.

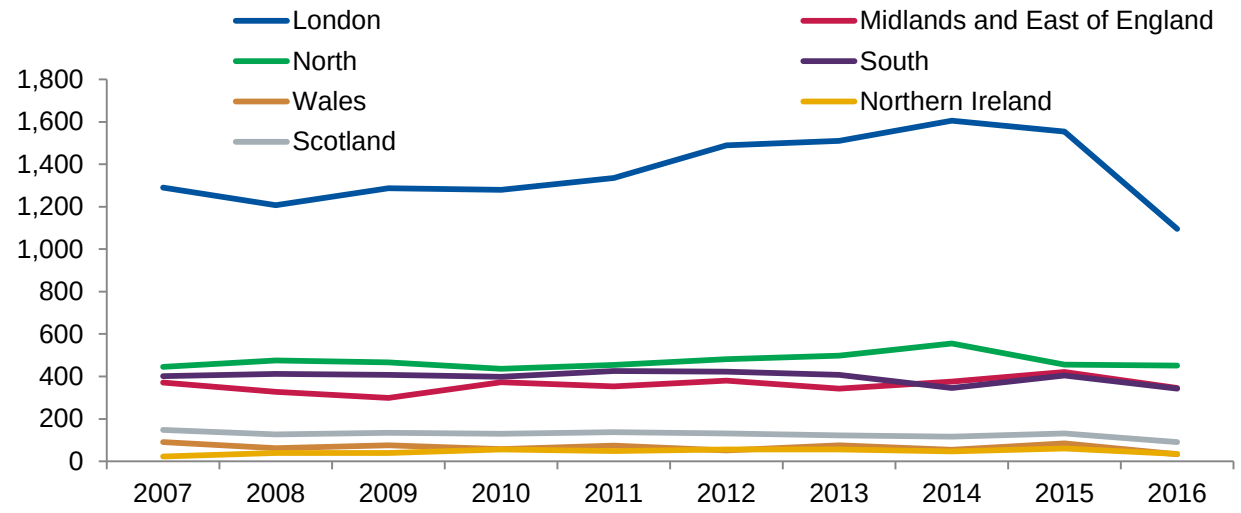
Figure 2: HIV diagnoses* by exposure group: UK, 2007 to 2016



*Adjusted for missing exposure information.

The decline in new HIV diagnoses in gay and bisexual men is particularly apparent in London, where diagnoses decreased by 29% from 1,554 in 2015 to 1,096 in 2016 (Figure 3). Declines were also observed elsewhere in England: the East Midlands (34%, 110 to 73), the West Midlands (24%, 192 to 145), the South East (10%, 259 to 233) and the South West (24%, 145 to 110). Over the same period, declines were seen in Wales (85 to 33), Northern Ireland (61 to 35) and in Scotland (131 to 90). However, the presentation of data at the PHE centre level masks greater declines in HIV diagnoses in cities with large lesbian, gay, bisexual and transgender (LGBT) populations, such as Brighton and Manchester.

Figure 3: Number* of new HIV diagnoses among gay and bisexual men, by region of diagnosis: UK, 2007 to 2016



*Observed data, not adjusted for missing information.

Within London, the decline in HIV diagnoses was most apparent in 5 large clinics where the number of men testing positive fell by 35%, from 1,034 in 2015 to 672 in 2016 (Figure 4a). Collectively, these clinics have been referred to as ‘large fall’ clinics and comprise Dean Street, Mortimer Market, Homerton, St Mary’s and St Thomas’. These 5 clinics reported 28% of all the new HIV diagnoses made in gay and bisexual men in England in 2016 (Figure 4a). Elsewhere in London, HIV diagnoses fell by 18%, from 520 in 2015 to 424 in 2016; outside London HIV diagnoses declined by 16% from 1,559 to 1,302.

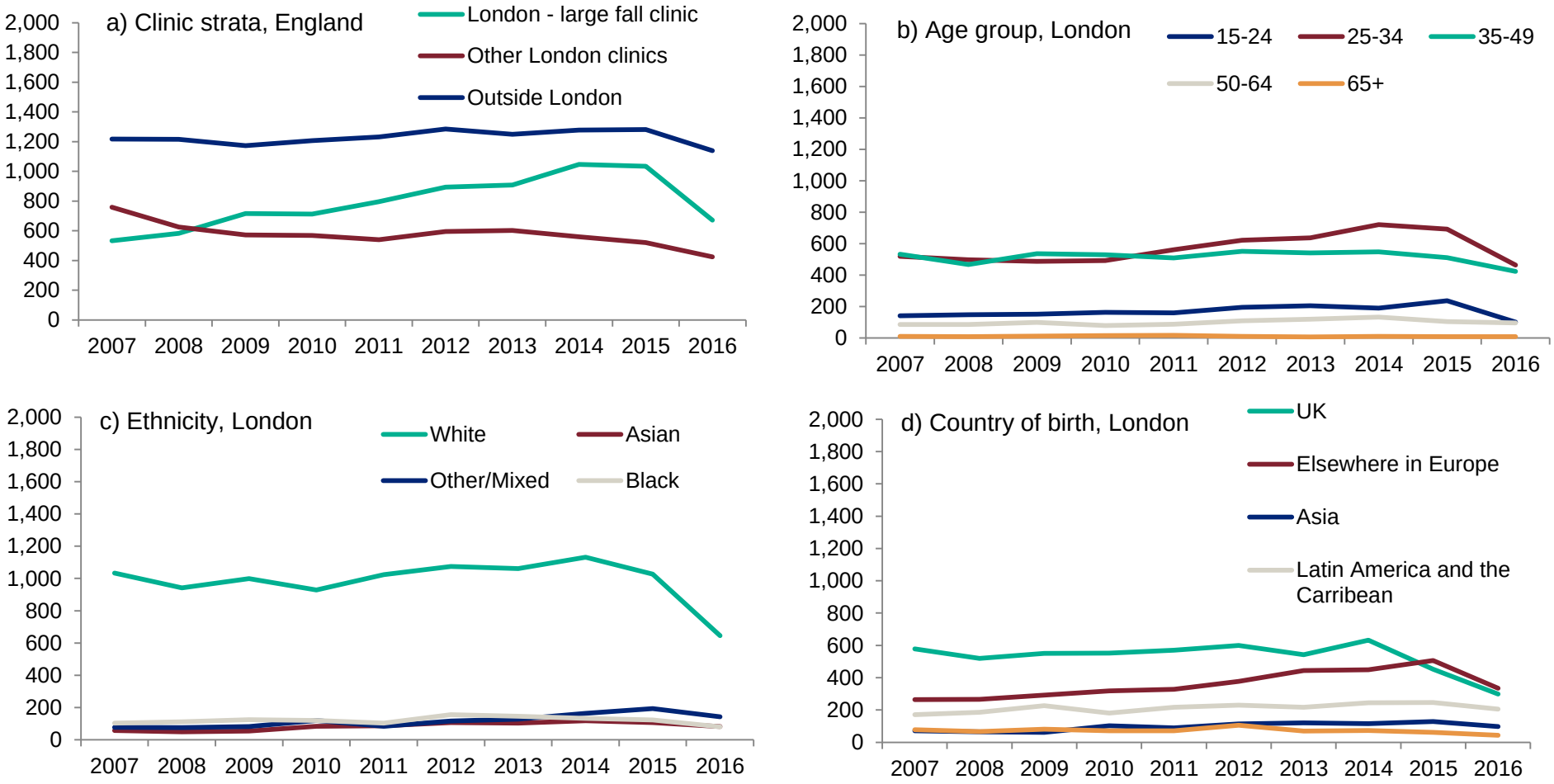
Between 2015 and 2016, within London, the steepest decline in HIV diagnoses was observed among men aged 15 to 24 years (57%, 237 to 102) (Figure 4b), followed by 25 to 34 year olds (33%, 693 to 464) and 35 to 49 years (17%, 511 to 424).

White men comprised 68% of all gay and bisexual men diagnosed in London in 2016 (Figure 4c); this population experienced a 37% decline from 1,027 in 2015 to 645 in 2016. While the overall number of BAME gay and bisexual men newly diagnosed with HIV in London is lower, declines were also observed relative to 2015 among Asian men (23%, 106 to 82), black men (34%, 123 to 81) and men of other/mixed ethnicity (26%, 194 to 143). In 2016, gay and bisexual men born in the UK or elsewhere in Europe made up 65% of all HIV diagnoses in gay and bisexual men in London. Both groups experienced a 34% decline in HIV diagnoses; 452 to 299 in UK-born men and 507 to 335 among men born elsewhere in Europe (Figure 4d).

Estimates of HIV incidence in gay and bisexual men

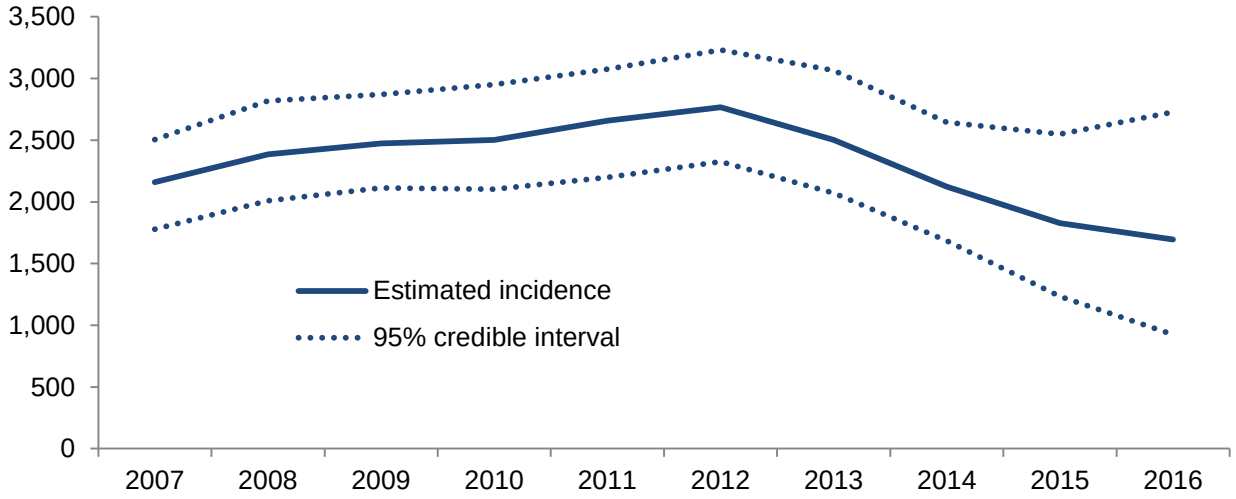
A CD4 back-calculation model is used to estimate HIV incidence among gay and bisexual men living in England (6). This model has been refined in 2017 to account for the increasing proportion of gay and bisexual men born abroad and previously diagnosed abroad (16% of gay and bisexual men in 2016), since these infections are unlikely to have been incident in England. Following this adjustment, the estimated number of infections acquired per year rose from around 2,200 infections (95% credible interval (CrI)1,800 to 2,500) in 2007 to a peak of 2,800 (CrI 2,300 to 3,200) in 2012 before falling to 1,700 (CrI 900 to 2,700) in 2016 (Figure 5).

Figure 4: HIV diagnoses* among gay and bisexual men, by population characteristics: England and London, 2007 to 2016.



*Observed data, not adjusted for missing information.

Figure 5: Estimates of HIV incidence in gay and bisexual men: England, 2007 to 2016



Recently acquired HIV infection at diagnosis among gay and bisexual men

In 2016, 45% of people newly diagnosed with HIV were assessed for recent infection using the recent infection testing algorithm (RITA) (7). The proportion of gay and bisexual men who were diagnosed at recent stage of infection (within the last 4 months) was 29%, in line with 2015 (Appendix 3).

New HIV diagnoses in heterosexual men and women

In 2016, 970 men and 1,140 women were newly diagnosed and reported to have acquired HIV through heterosexual contact[9]. The number of heterosexual men and women newly diagnosed with HIV has halved over the past 10 years, from 4,060 in 2007 to 2,110 in 2016. This decline was particularly steep in London (from 1,432 to 551) (Figure 6). The drop is predominantly due to fewer diagnoses among African-born men and women, which reflects changing migration patterns.

In 2016, the number of diagnoses among heterosexuals was highest in London (551), followed by the Midlands and East of England (420), the North of England (320) and the South of England (307). In Wales, Northern Ireland and Scotland the number of new diagnoses among heterosexuals was lower at 24, 17 and 85 respectively.

Overall, 30% (250/828) of heterosexual men were aged 50 years or over at the time of their diagnosis, compared with 21% (185/898) of heterosexual women. This compares to 16% (243/1,567) and 6% (149/2,361) in 2007 respectively. The median age at

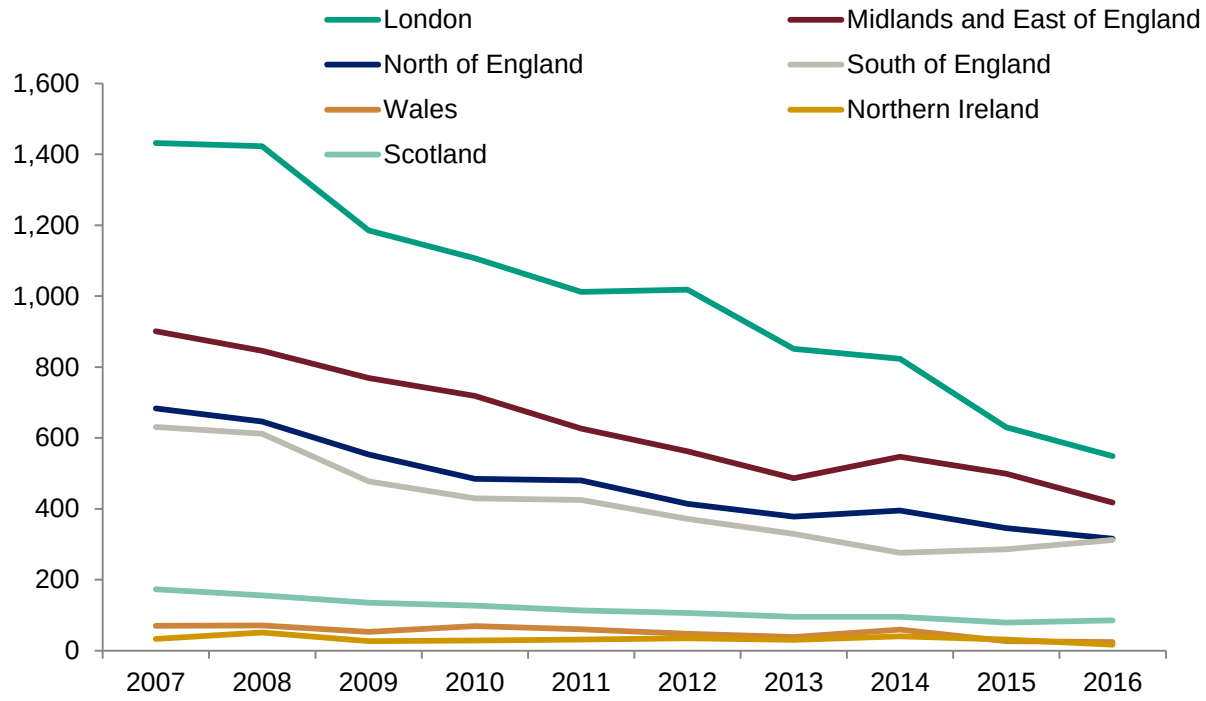
[9] Data rounded after adjustment for missing information.

diagnosis in 2016 was 44 years among heterosexual men and 40 years among heterosexual women.

In 2016, black African men and women comprised 39% (669/1,726) of heterosexual adults with a new HIV diagnosis (Figure 7). This numerical and proportional decrease, from 68% (2,664/3,928) in 2007, is likely to be due to changing patterns of migration. In contrast, the number of white heterosexual men and women with a new HIV diagnosis has remained relatively stable at around 750 per year. In 2016, one in three (38%; 656/1,726) heterosexuals diagnosed were white, compared to one in five in 2007 (19%; 756/3,928).

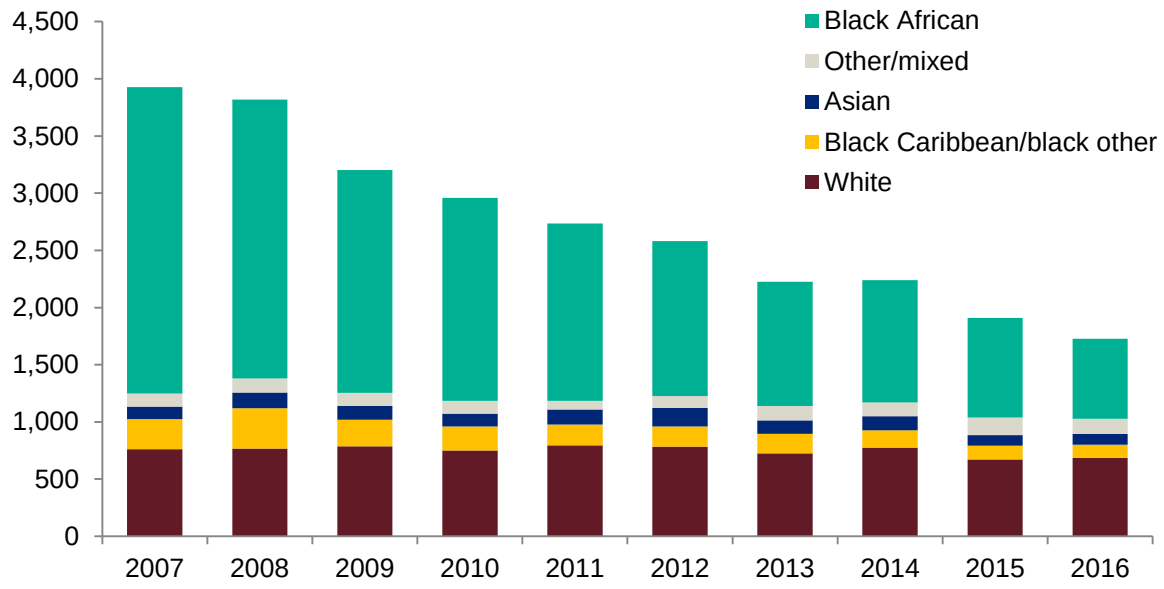
In 2016, 13% of heterosexual men and 13% of heterosexual women were likely to have a recently acquired infection (within the 4 months preceding their HIV diagnosis) based on the 45% (2,333/5,164) with a RITA result (Appendix 3).

Figure 6: Number* of new HIV diagnoses among heterosexual men and women, by region of diagnosis: UK, 2007 to 2016



*Observed data, not adjusted for missing information.

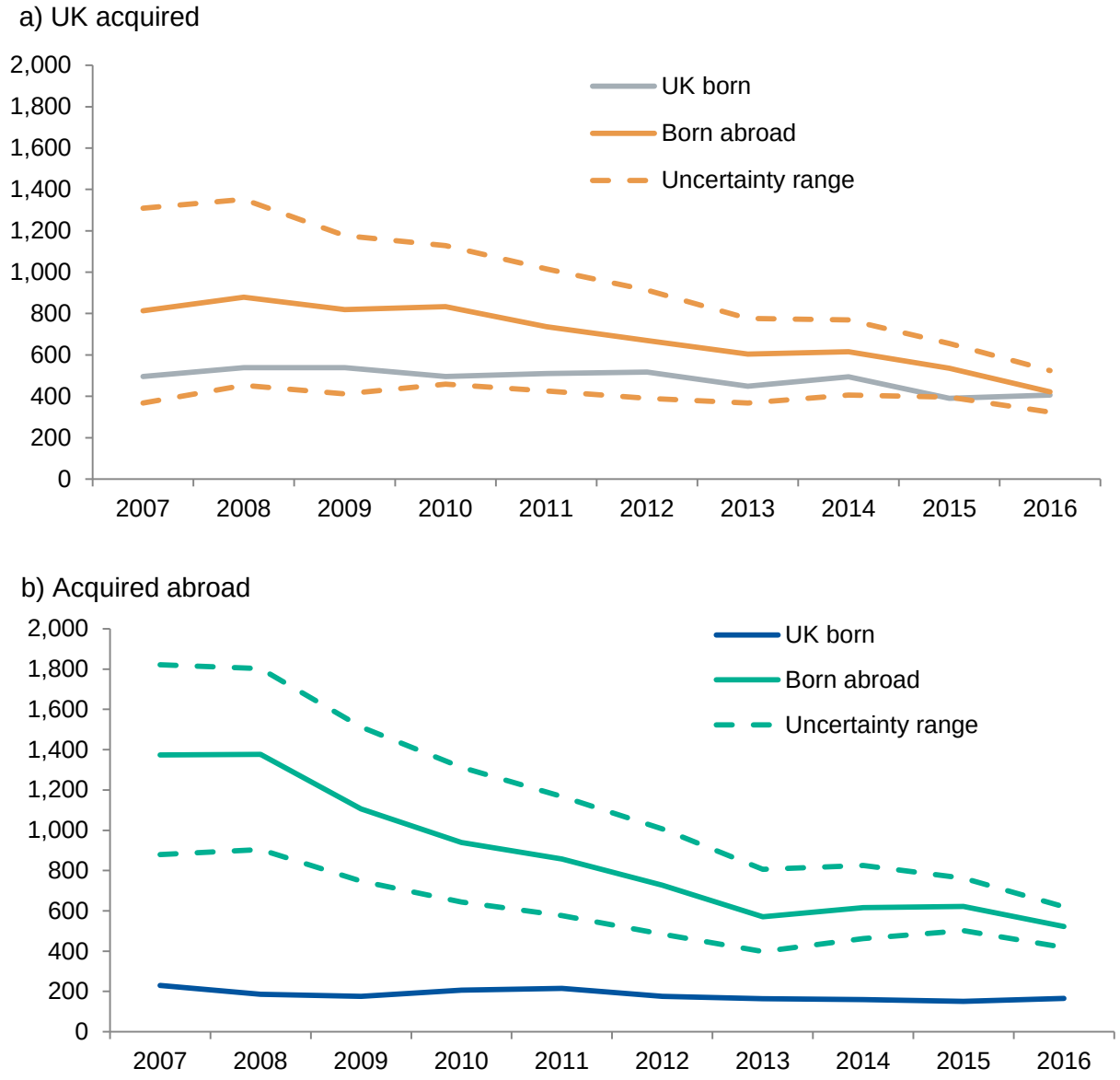
Figure 7: New HIV diagnoses* among heterosexual men and women by ethnicity: UK, 2007 to 2016



*Data adjusted for missing ethnicity information.

By assigning probable country of infection based upon information on CD4 decline and year of UK arrival, the number of heterosexuals likely to have acquired HIV after arrival to the UK can be estimated. The model suggests a decline in infections acquired post migration from 1,300 (IQR 860 to 1,805) in 2007 to 850 (IQR 730 to 930) in 2016, with the steepest decline observed among those born abroad (Figure 8a). The number of heterosexuals estimated to have acquired HIV abroad has seen a much steeper decline from 1,600 (IQR 1,100 to 2,100) in 2007 to 700 (IQR 600 to 800) in 2016 (Figure 8b), reflecting changing patterns of migration. Overall it is estimated that about half (55%) of all new diagnoses in heterosexual men and women in 2016 were acquired in the UK.

Figure 8: Estimated number of new diagnoses among heterosexual men and women acquired in the UK and abroad, by country of birth: UK, 2007 to 2016



HIV diagnoses in people who inject drugs

The number of people who acquired HIV through injecting drug use in the UK remains low (130) comprising 2% of all new HIV diagnoses in 2016, of which 73% were men. In 2015, the number of new HIV diagnoses rose to 190 diagnoses due to an HIV outbreak among PWIDs living in Glasgow; the number of HIV diagnoses in 2016 is in line with the number reported in 2014 and previous years. The ‘Shooting Up’ report on infections among people who inject drugs includes further details of HIV acquisition and transmission in this group (8).

Mother-to-child transmission

In 2016, 41 children were diagnosed with HIV following mother-to-child transmission[10]. All but 5 were born outside of the UK, and of these, 3 were born before 2016. The risk of vertical transmission of HIV in the UK remains extremely low (below 0.5% between 2014 and 2016); this is because almost all were born to women who were already aware of their HIV status and receiving ART. This benefits the mother's health and protects their child from acquiring HIV.

Late HIV diagnoses

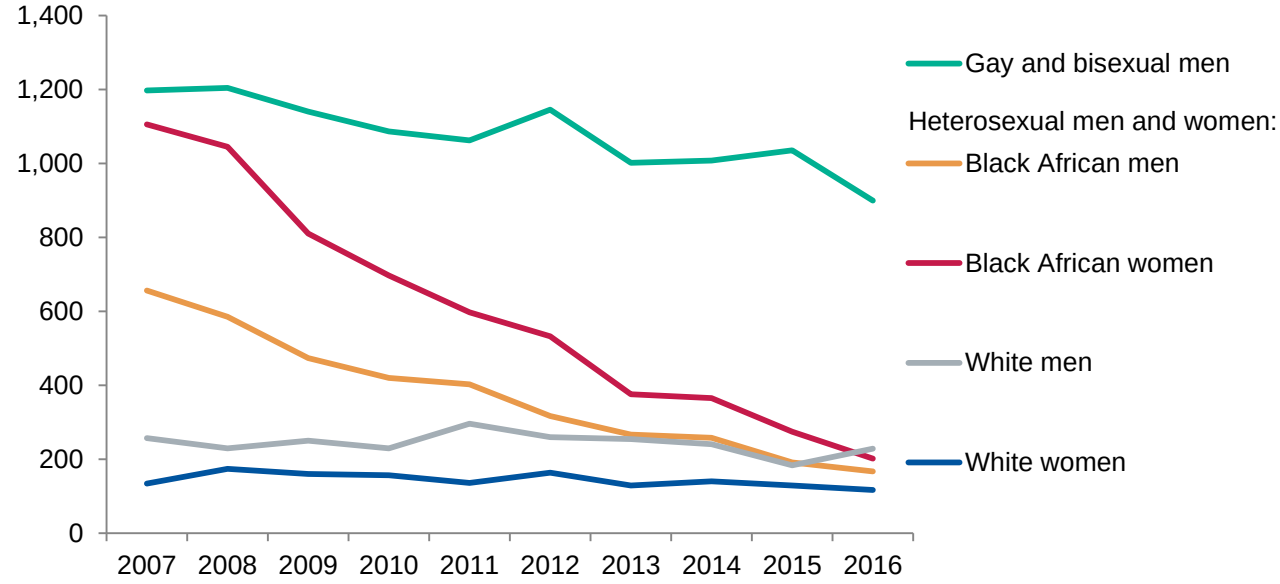
Late diagnosis is the most important predictor of morbidity and premature mortality among people with HIV infection (9). For surveillance purposes, a late HIV diagnosis is defined as having a CD4 cell count <350 cells/mm^3 within 91 days of HIV diagnosis[11]. People diagnosed late are likely to have been living with an undiagnosed HIV infection for around 3 to 5 years and may have been at risk of passing on HIV to partners if having sex without condoms.

The number of late HIV diagnoses[12] has decreased by 45% from 3,930 in 2007 to 2,170 in 2016. The decline was most marked among black African heterosexual women (82% 1,100 to 200) and men (74% from 700 to 170) (Figure 9a). In contrast, the number of white heterosexual men and women who are diagnosed late has remained relatively stable over the past decade at around 240 in men and 140 in women. A 25% decline from 1,200 to 900 in gay and bisexual men was observed over the same period.

In 2016, 42% (2,159/5,164)[12] of HIV diagnoses were made at a late stage of HIV infection. Rates were highest in heterosexual men (60%, 413/684)[13] and heterosexual women (47%, 354/748) (Figure 9b) (Appendix 4); equivalent figures for black African heterosexual men and women were 65% (139/215) and 49% (165/335) respectively. The lowest proportion of late diagnosis was among gay and bisexual men, with 32% (663/2,096) diagnosed late. Overall, 51% (41/80) of PWIDs were diagnosed late. In 2016, 23% (1,190/5,164) of those diagnosed were severely immunocompromised at the time of their diagnosis, with a CD4 count <200 cells/mm^3.

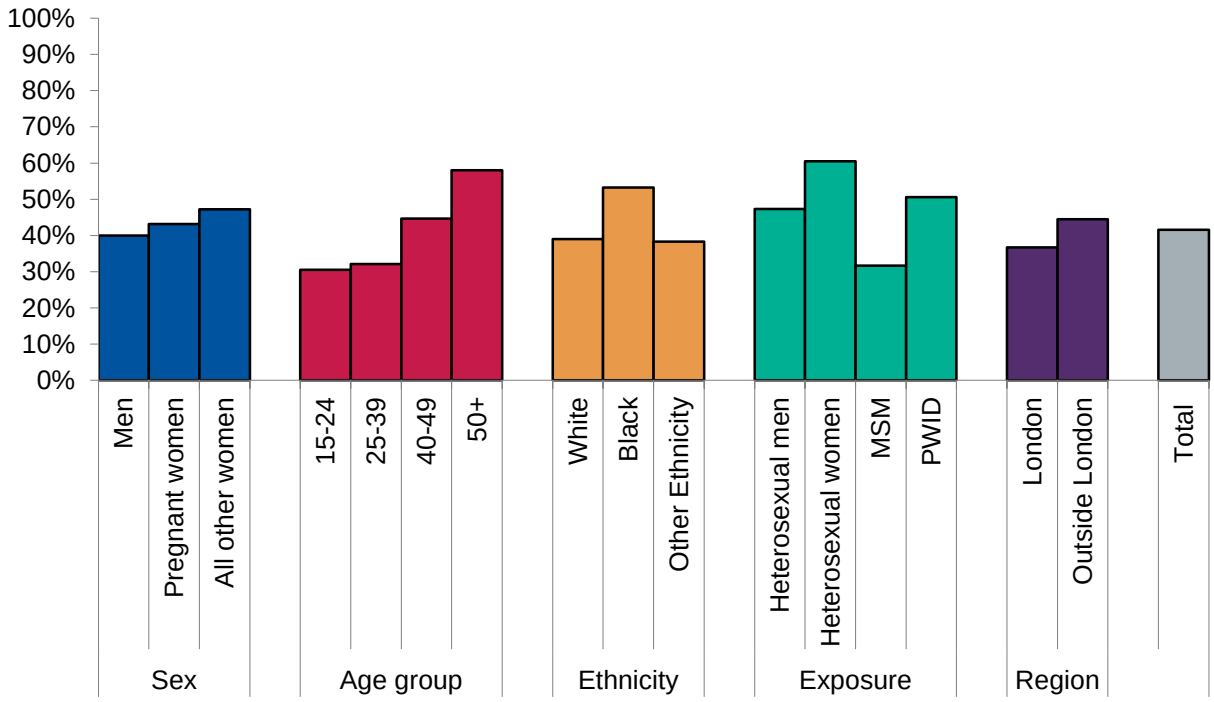
[10] This figure is greater than the 27 diagnoses reported among children as it contains individuals diagnosed abroad as older children who have arrived in the UK as adults.
[11] The definition of a late HIV diagnosis includes people reported to have had a diagnosis abroad prior to a UK diagnosis and does not currently exclude those with clinical indication of a recently acquired HIV infection (For example, through RITA or a recent HIV negative test).
[12] Adjusting for missing CD4 information. CD4 count at diagnosis was 76% complete in 2016.
[13] Observed data (not adjusted for missing CD4 information).

Figure 9a: Adjusted* number of people diagnosed late by risk group: UK, 2007 to 2016



*Adjusted for missing CD4 count at diagnosis.

Figure 9b: Proportion of HIV diagnoses made at a late stage of infection*, by risk group: UK, 2016



*CD4 count <350 cells/mm^3 within 91 days of HIV diagnosis.

The proportion of HIV diagnoses made at a late stage of infection increases with age. In 2016, 31% (129/422) of people aged 15 to 24 years were diagnosed late compared to 57% (336/594) and 63% (77/123) among those aged 50 to 64 years and over 65 years respectively.

Rates of late diagnosis also varied regionally, with the highest rate of 47% seen in both the Midlands and East of England (384/811) and Wales (30/62), followed by the North of England (42%, 297/5,704) and the South of England (45%, 267/591). The lowest rates were observed in London (36%, 564/1,565) and 43% of diagnoses were classified late in both Scotland (72/166) and Northern Ireland (26/61).

The rate of late HIV diagnosis is a key indicator in PHE's Public Health Outcomes Framework (PHOF), accessible from the following webpage: www.phoutcomes.info.

AIDS and deaths among people with HIV

The number of people diagnosed with AIDS and the number of people who have died has steadily declined over the past decade. In 2016, 278 people were diagnosed with an AIDS-defining illness at, or within 3 months, of their HIV diagnosis, a 25% decline on the 372 diagnoses made in 2015.

Pneumocystis pneumonia remains the most commonly diagnosed AIDS-defining illness, accounting for 38% (128/341) of AIDS diagnoses in 2016, followed by Kaposi's sarcoma (9%; 30/341) and *Mycobacterium tuberculosis* (8%; 28/341).

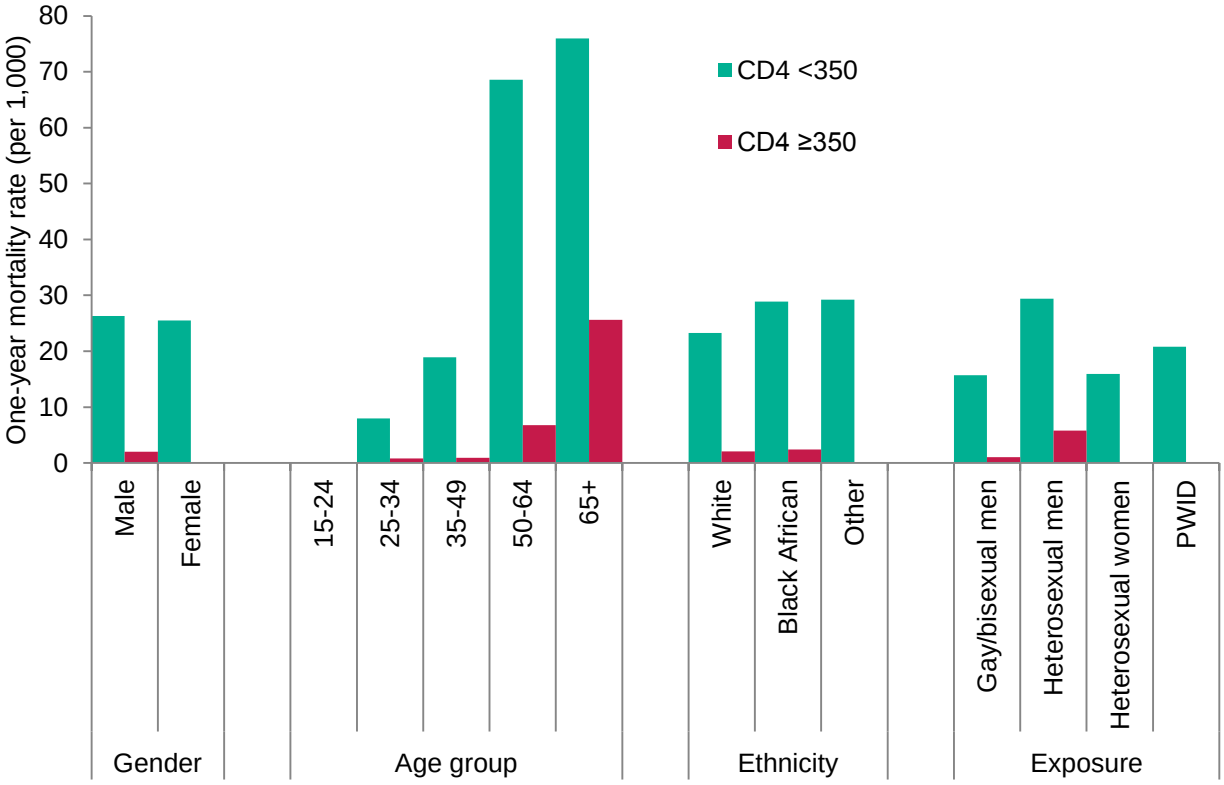
In 2016, 442 people with HIV infection died from any cause and over half of deaths (60%; 266/442) were among people aged 50 years and over. Mortality rates were similar among gay and bisexual men and heterosexuals with diagnosed HIV, at 2.41 per 1,000 and 2.68 per 1,000 respectively. People diagnosed with HIV who injected drugs had the highest rate of death, at 14.36 per 1,000.

All-cause mortality among people with HIV aged 15 to 59 years continues to decline year on year and was 3.57 per 1,000 in 2016 compared to 9.98 per 1,000 in 2007. The crude mortality rate among people aged 15 to 59 years who were diagnosed promptly was 1.22 per 1,000, in line with the general population of the same age group (1.39 per 1,000). Among men, equivalent figures were 1.39 and 1.69 per 1,000 population aged 15 to 59 years respectively (0.85 and 1.10 among women).

People diagnosed late are at increased risk of developing an AIDS-defining illness and continue to have a more than 10-fold increased risk of death in the year following their diagnosis. One-year mortality among people diagnosed late in 2015 was 26.07 per

1,000, compared to 1.62 per 1,000 among people diagnosed promptly (Figure 10). One-year mortality was particularly marked among people aged 50 years and over, where one in fourteen people diagnosed late in 2015 died within a year of diagnosis.

Figure 10: One-year mortality rate among adults newly diagnosed with HIV by CD4 cells/mm^3 at diagnosis: UK, 2015

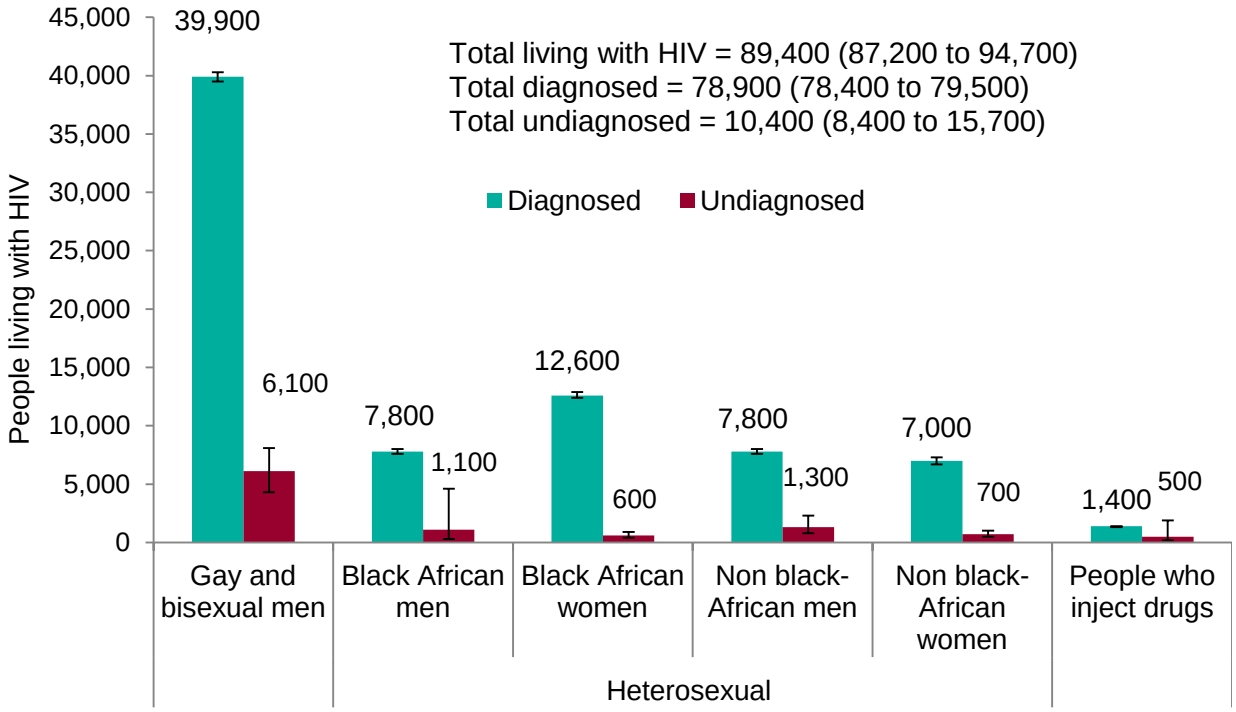


Part 2: Towards elimination of HIV transmission, AIDS and HIV-related deaths

Estimates of the number of people living with HIV infection who are aware of their HIV infection

UNAIDS has set a target for 90% of people living with HIV to be diagnosed. In 2016, it was estimated that there were 89,400 (CrI 87,200 to 94,700) people living with HIV infection in England, of whom an estimated 10,400 (CrI 8,400 to 15,700) were unaware of their infection (Figure 11, Appendix 1), equivalent to 12% (CrI 10 to 17%) of the total. This compares to an estimated 13,300 (CrI 10,600 to 18,200) people living with undiagnosed[14] HIV in England in 2015; equivalent to 15% (CrI 12 to 19%) of the 89,800 (CrI 87,100 to 94,800) people estimated to be living with HIV in England in 2015.

Figure 11: Estimated* number of people living with HIV (diagnosed and undiagnosed) all ages: England, 2016



*Estimates do not add to totals and subtotals due to rounding.

[14] The 2015 estimate has been updated since publication in 2016. The method has been further refined and new data sources have been incorporated to better reflect recent risk behaviours. Estimates for the United Kingdom will be published in early 2018.

The revised[14] estimate of the number of people living with HIV infection is similar between 2015 and 2016 and must be interpreted in the context of the credible intervals. This is because while 5,164 HIV diagnoses were made in 2016, there has been a decrease in the estimated size of the undiagnosed population compared to 2015. In gay and bisexual men this is thought to be due to high testing rates and reduced incidence. In heterosexual men and women this is thought to be due to a continued reduction of late HIV diagnoses.

Using these estimates, the overall prevalence of HIV in England in 2016 was 1.6 per 1,000 (CrI 1.6 to 1.8) among people of all ages and 2.2 per 1,000 (CrI 2.1 to 2.3) among people aged 15 to 74 years. HIV prevalence was higher among men, estimated at 3.2 per 1,000 (CrI 3.1 to 3.5) compared with women, estimated at 1.1 per 1,000 (CrI 1.1 to 1.1).

England is close to meeting the UNAIDS targets with 88% (CrI 83 to 90%) of people living with HIV estimated to be diagnosed and this threshold has been reached in London: 90% (CrI 84 to 93%). Outside of London, 87% (CrI 82 to 90%) of people living with HIV were estimated to be diagnosed (Appendix 2).

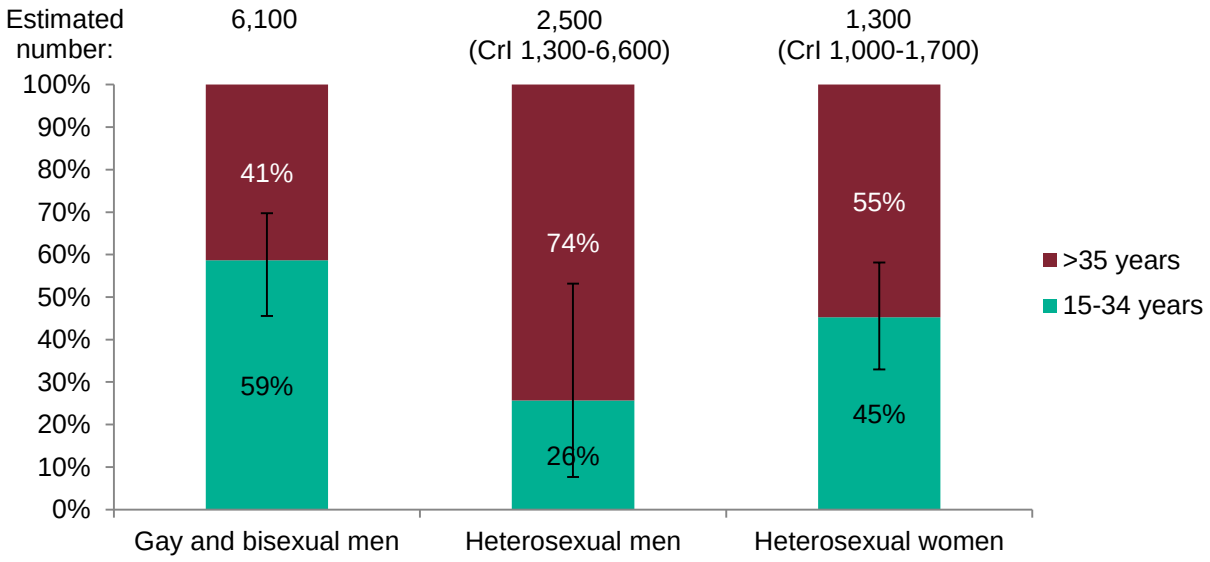
Estimates of undiagnosed HIV infection among gay and bisexual men

A total of 46,000 (CrI 44,300 to 48,000) gay and bisexual men were estimated to be living with HIV in 2016 (Appendix 1). Estimating that 2.9% (CrI 2.5 to 3.3%) of men aged 15 to 59 years are men who have had sex with other men in the past 5 years (594,500, CrI 517,300 to 665,800 men in 2016), the prevalence of HIV in gay and bisexual men aged 15 to 59 years was 77 (CrI 69 to 86) per 1,000. HIV prevalence was higher in London, with 128 (CrI 100 to 158) per 1,000 gay and bisexual men estimated to be living with HIV, compared with 57 (CrI 50 to 67) per 1,000 in the rest of England.

Among gay and bisexual men living with HIV in London, 90% (CrI 86 to 91%) were estimated to be diagnosed, meeting the UNAIDS target. Elsewhere in England, the equivalent estimate was 87% (CrI 78 to 90%).

An estimated 6,100 (CrI 4,300 to 8,100) gay and bisexual men were estimated to be living with an undiagnosed HIV infection in 2016. While credible intervals overlap, this estimate is lower than the estimated 8,300 (CrI 6,000 to 11,000) in 2015. Undiagnosed infection rates were lower in London (10%, CrI 9 to 14%) compared to elsewhere in England (16%, CrI 10 to 22%). Of gay and bisexual men living with an undiagnosed HIV infection, 59% (CrI 47 to 71%) were estimated to be aged 15 to 34 years (Figure 12), equivalent to 2,500 men (CrI 1,800 to 3,600).

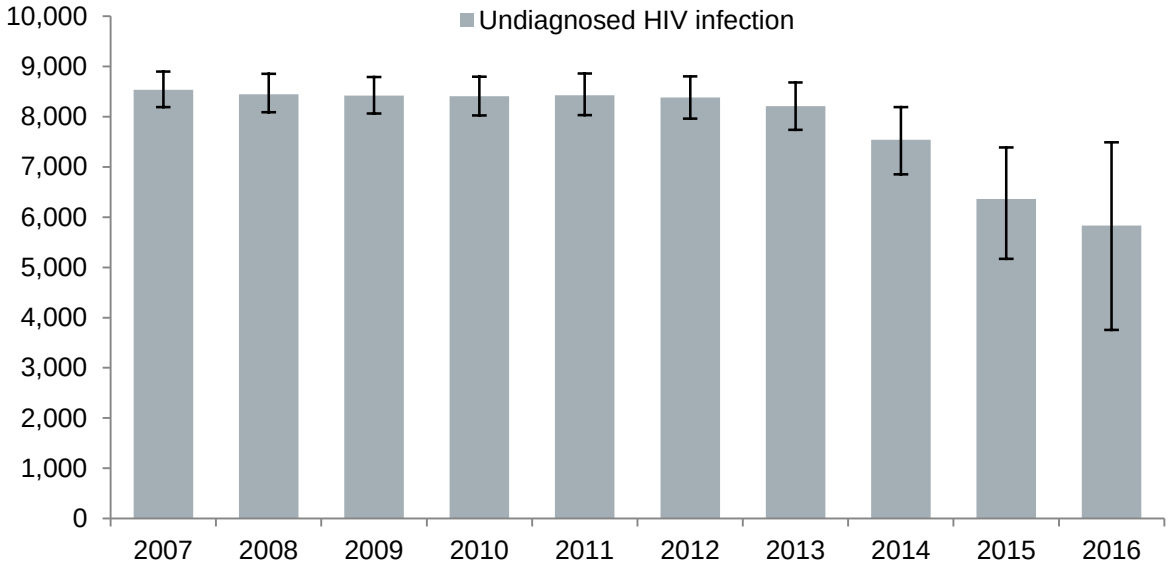
Figure 12: Estimated* number of people living with undiagnosed HIV infection by exposure and estimated proportions by age group: England, 2016



*Error bars reflect the credible intervals in age distribution.

Using the CD4 back-calculation method it is estimated that in 2016, a total of 5,900 gay and bisexual men (CrI 4,200 to 7,900) were living with an undiagnosed HIV infection in England in 2016 (Figure 13). While the credible intervals overlap between years, estimated numbers appear to decline; an estimated 8,400 (CrI 8,000 to 8,800) were living with undiagnosed infection in 2012 compared to 6,400 (CrI 5,300 to 7,600) in 2015.

Figure 13: Estimates of undiagnosed HIV infection in gay and bisexual men using a CD4 back calculation method, England, 2007 to 2016



Estimated undiagnosed HIV infection among heterosexual men and women

In 2016, 18,000 (CrI 16,800 to 22,300) heterosexual men and 20,900 (CrI 20,400 to 21,400) heterosexual women were estimated to be living with HIV in England, of whom 8,900 (CrI 8,100 to 12,400) were black African men and 13,200 (CrI 12,900 to 13,600) were black African women (Appendix 1). The estimated prevalence of HIV among heterosexual men and women aged 15 to 59 years was low (1, CrI 1 to 1 per 1,000), but greater among black African adults; 23 (CrI 22 to 25) per 1,000 among black African heterosexual men and 34 (CrI 34 to 35) per 1,000 among black African heterosexual women.

Overall, 3,900 (CrI 2,500 to 7,900) heterosexual men and women were estimated to be living with an undiagnosed HIV infection, equivalent to 10% (CrI 7 to 18%) of the 39,000 (CrI 37,600 to 17,000) heterosexual adults living with HIV in England. Consequently, the UNAIDS target has been met in this population group in 2016. A similar proportion of heterosexuals were estimated to be unaware of their HIV infection in London (9%, CrI 4 to 20%) and outside London (10%, CrI 7 to 18% (Appendix 2)). The 3,900 heterosexual men and women who were estimated to be unaware of HIV infection in 2016 compares to an estimated 4,500 (CrI 3,400 to 8,100) in 2015.

In 2016, there was an older age distribution of heterosexual men and women estimated to be unaware of their infection. Overall, 74% of heterosexual men unaware of their HIV infection were estimated to be aged over 35 years, compared to 55% among heterosexual women and 41% in gay and bisexual men.

Progress in reducing undiagnosed HIV infection through increasing HIV testing

Most HIV tests are carried out in sexual health services. The number of people attending these services continues to rise, with over one million people tested for HIV in 2016 in England (10). Further information on HIV testing in all settings can be found in Public Health England's 2017 report on HIV testing (11).

The number of gay and bisexual men tested for HIV in sexual health services continues to rise, with 104,500 tested in 2016, up from 72,700 in 2012. In 2016, an HIV test was offered to 93% (109,400/118,100) of eligible gay and bisexual men attending sexual health services, resulting in a testing coverage of 89% (104,500).

Among eligible heterosexual men and women, 91% (475,100/521,600) and 83% (801,200/965,600) were offered a test respectively in 2016. Overall, HIV test coverage was 77% (401,500) among heterosexual men and 56% (536,900) among heterosexual women.

Repeat testing in gay and bisexual men

Gay and bisexual men are advised to test for HIV if having sex without condoms at least annually and every 3 months if having sex with new or casual partners. Of the 118,100 gay and bisexual men eligible for testing for HIV in sexual health services in 2016, 28% (28,826) had had at least one HIV test in the preceding year (defined as frequent testers) with 8% (9,908) having had 2 or more HIV tests in the preceding year. Over three-quarters of HIV diagnoses (77%) made in gay and bisexual men attending sexual health services occurred among infrequent testers in 2016. Figure 14 shows the number of HIV tests and HIV diagnoses in gay and bisexual men stratified by frequent and infrequent testers in 3 settings.

Figure 14a shows that the 5 ‘large fall’ clinics experiencing a decline in HIV diagnoses in 2016, also demonstrated an increase in the number of HIV tests, particularly among frequent HIV testers, with the decline in HIV diagnoses being most apparent in infrequent testers. In this setting, the high HIV testing volumes, including among frequent testers, resulted in men who acquired HIV being diagnosed and treated and rapidly achieving untransmissible levels of virus.

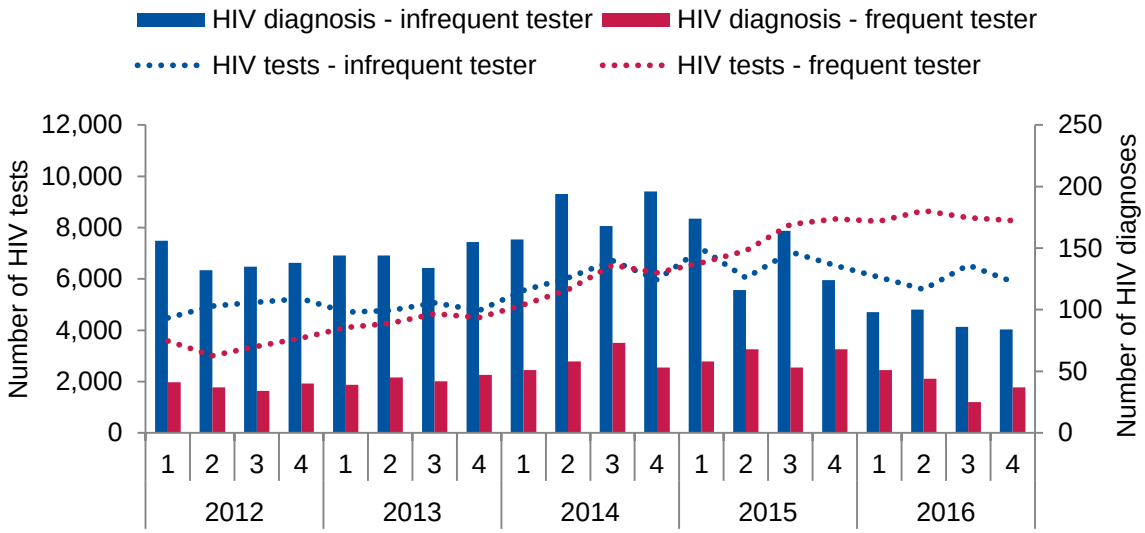
In other London clinics (Figure 14b), the number of frequent and infrequent testers remained stable and outside London (Figure 14c), the number of new and repeat testers increased equally, although with limited effect on HIV diagnoses in either setting.

Of the 25,231 gay and bisexual men assessed as being high risk[15] in 2015, 48% (12,230) returned within 90 to 365 days of initial assessment. Of these men, 95% (10,800) had at least one HIV test within that time period; 55% had only 1 test, 23% had 2 tests and 17% had 3 or more tests during this time period.

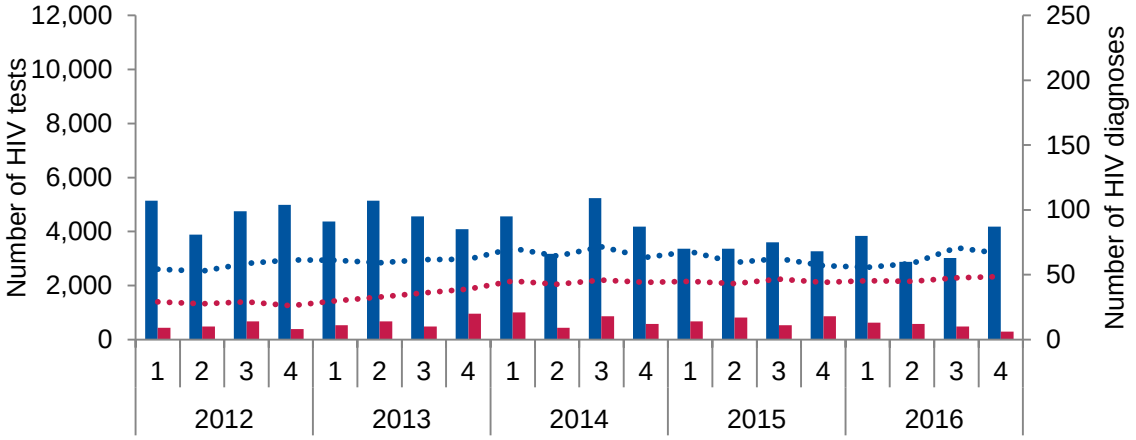
[15] Defined as a diagnosis of a bacterial STI (non pharyngeal).

Figure 14: Number of HIV tests and HIV diagnoses by frequent and non-frequent* HIV testing status, England, 2012 to 2016

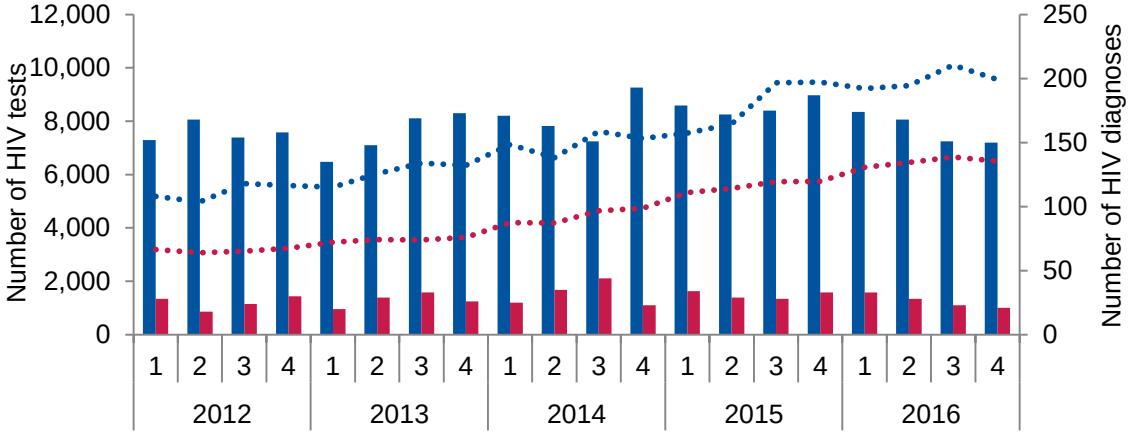
a) London large fall clinics



b) Other London clinics



c) Clinics outside London



*Frequent testing defined as at least 1 HIV test in the previous 12 months. Infrequent test as the first test within a 12-month period.

Proportion of people living with diagnosed HIV infection receiving treatment

UNAIDS has set a target of 90% of those diagnosed to be receiving treatment. Overall in 2016, 96% of the 91,987 people living with a diagnosed HIV infection in the UK received ART, compared to 94% in 2015 and 74% in 2007 (Figure 15a). There were no substantial differences between exposure groups in terms of treatment coverage, with the slight exception of younger people and PWIDs, who had coverage of 89% and 93% in 2016 respectively (Figure 15b).

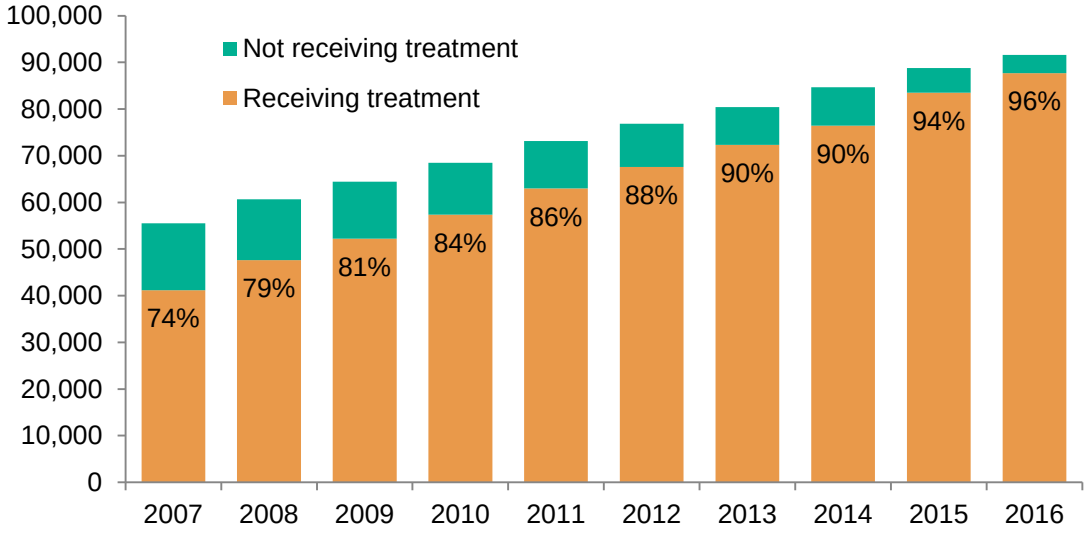
The number of people starting ART has increased from 4,800 in 2012 to 6,700 in 2015 dropping slightly to 5,700 in 2016. Meanwhile, the proportion of people starting treatment with a CD4 count ≥350 cells/mm^3 has increased from 51% (2,229/4,345) in 2012 to 67% (3,205/4,800) in 2016. This reflects 2 changes: firstly the reduction in late HIV diagnoses; and secondly, the evolution of national and international HIV treatment guidelines, which have progressively indicated early ART to both prevent onward transmission and deliver clinical benefit for the patient (12). Overall in 2016, 76% (2,017/2,649) of gay and bisexual men started ART with a CD4 count over 350 cells/mm^3 compared to 54% (930/1,682) among heterosexual men and women.

The time interval between being newly diagnosed with HIV and starting ART has dropped significantly over the past ten years. In 2007, 33% (1,811/5,411) of people newly diagnosed started ART within 90 days of HIV diagnosis (53% (1,423/2,692) among people with a CD4 count <350 cells/mm^3 and 14% (351/2,514) among people with a CD4 count ≥350 cells/mm^3); the equivalent figures for 2016 were 76% (3,214/4,225), 85% (1,361/1,594) and 74% (1,647/2,229) respectively (Figure 16). In 2016, 77% (1,174/1,520) of heterosexual men and women started ART within 90 days of diagnosis, compared to 76% (1,130/1,490) among gay and bisexual men and 57% (17/30) among PWIDs.

Overall, nationally in 2016, 76% of people newly diagnosed with HIV started ART within 90 days of diagnosis. However, this substantial masks major variation at an individual clinic level where rates of prompt treatment range from 14% to 100% (Figure 17).

Figure 15: ART coverage among people accessing HIV specialist care, UK

a) Over time, 2007 to 2016



b) By risk group, 2016

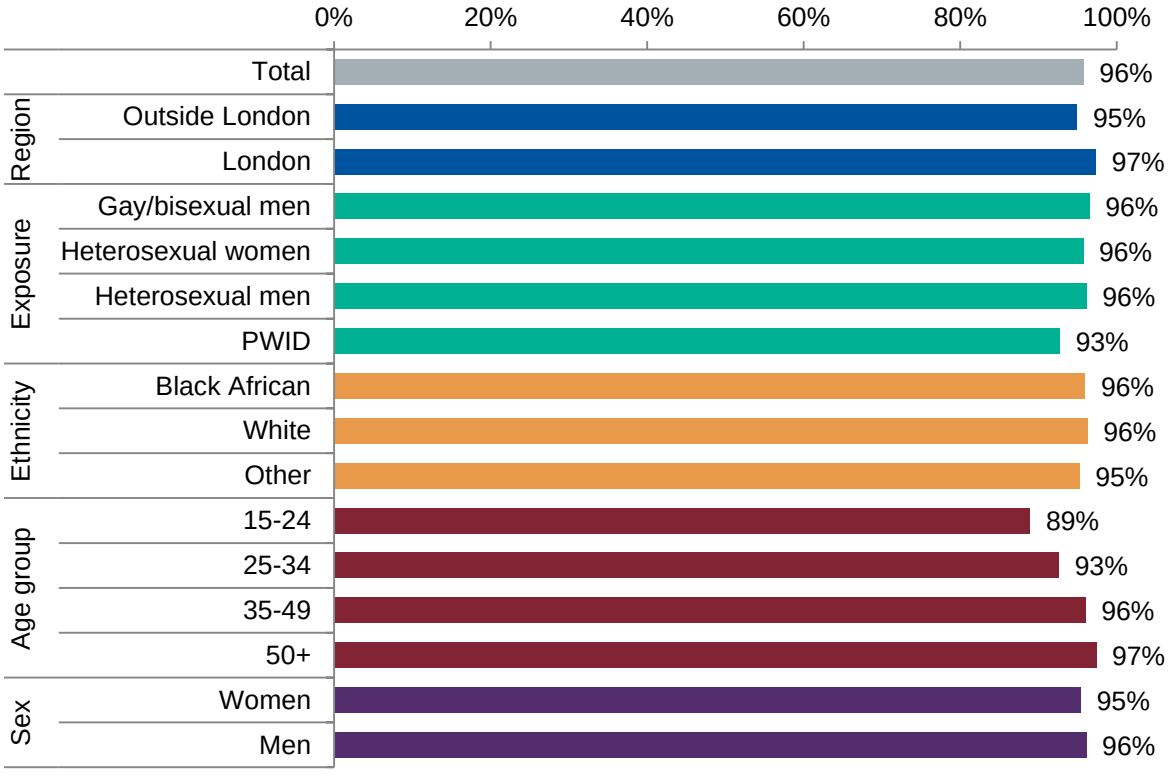


Figure 16: Time to treatment among patients newly diagnosed: UK, 2012 to 2016

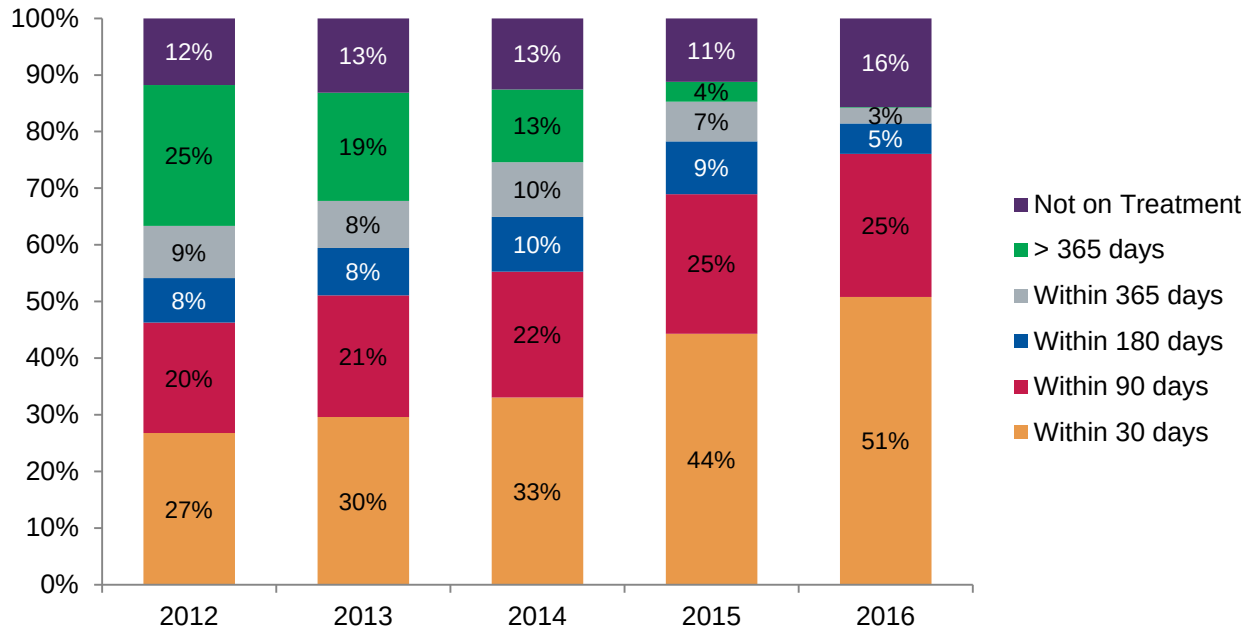
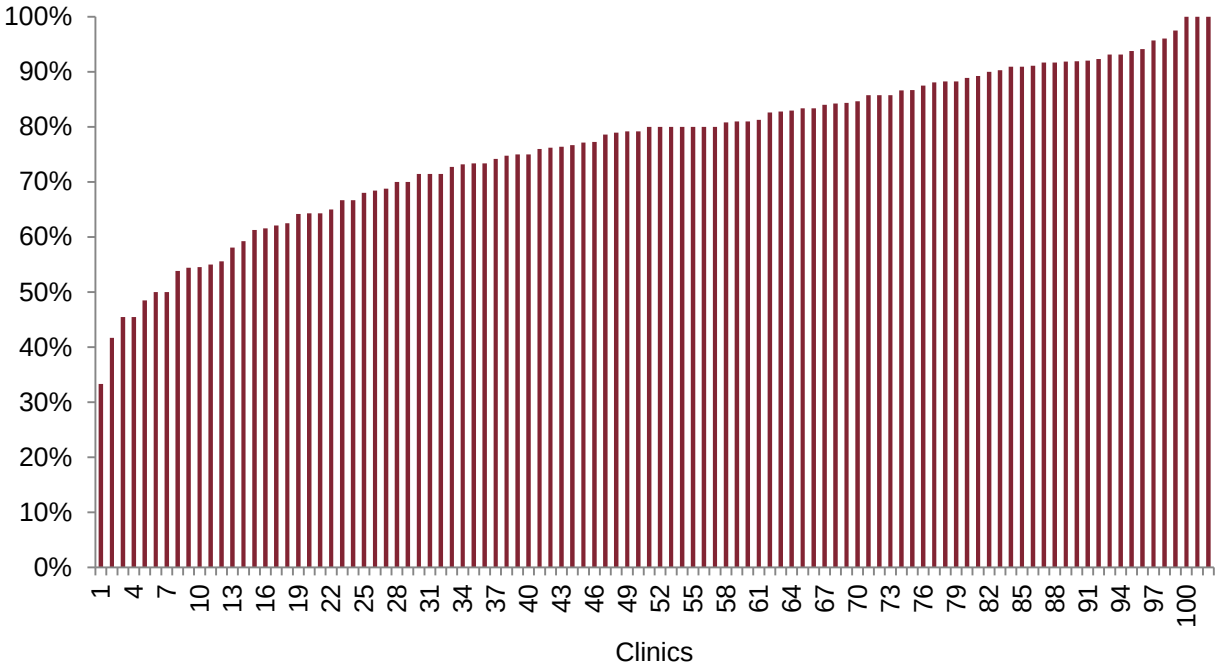


Figure 17: Proportion of patients newly diagnosed starting ART within 90 days of diagnosis, by anonymised HIV services*: UK, 2016



*Services with fewer than 10 HIV diagnoses in 2016 are excluded.

Proportion of people living with diagnosed HIV infection, receiving treatment who have an untransmissible virus

UNAIDS has set the target for 90% of those treated to be virally suppressed. In 2016, 97% (77,923/80,574) of people receiving treatment in the UK with a reported viral load had an undetectable viral load and were very unlikely to pass on HIV, even if having sex without condoms (untransmissible virus). The proportion of the treated population who were virally suppressed was consistently high across exposure groups, being 97% for gay and bisexual men, heterosexual men and heterosexual women and 93% for PWIDs.

Continuum of HIV care

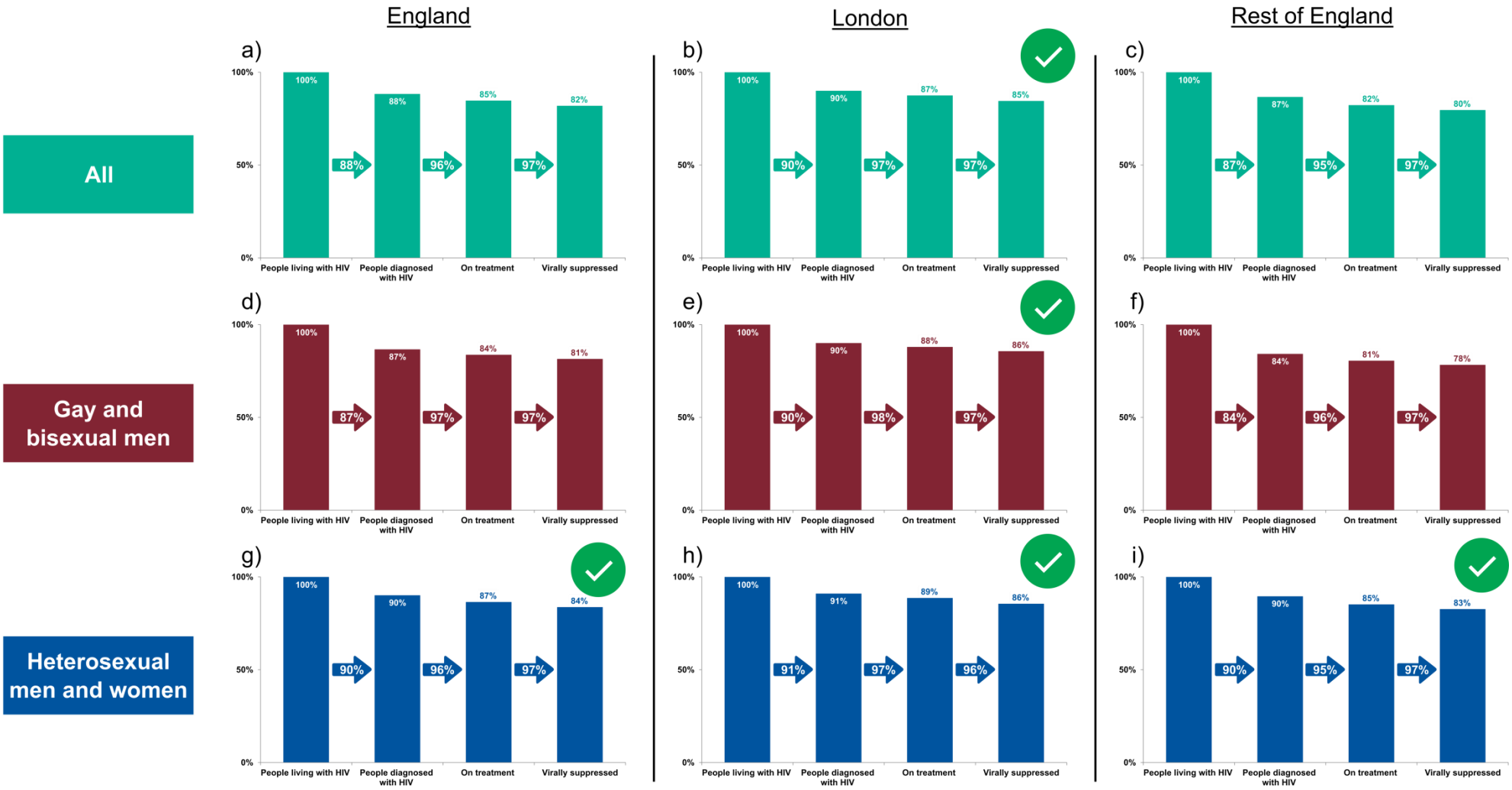
The continuum of HIV care illustrates key measures of HIV care and provides an opportunity to assess progress towards the Joint United Nations Programme on HIV/AIDS (UNAIDS) 90:90:90 targets (1).

England is on the cusp of achieving these targets in 2016 with 88% (CrI 83 to 90%) of the 89,360 (95% CrI 87,200 to 94,700) estimated number of people living with HIV being diagnosed (Figure 18a). Of those diagnosed, 96% were receiving HIV treatment and of those receiving treatment, 97% had a suppressed viral load, fulfilling the second 2 metrics. Overall in England, 82% of people living with HIV are estimated to have a suppressed viral load, surpassing the overall aim of the UNAIDS target (73%).

The UNAIDS targets have been met and exceeded in London in 2016 with 90% (CrI 84 to 93%) of people living with HIV diagnosed, 97% receiving treatment and 97% of those on treatment with a suppressed viral load (Figure 18b).

The targets have also been met among heterosexuals in England (both inside and outside of London, Figures 18g-i), where 90% (CrI 82 to 93%) were estimated to be diagnosed, 96% were receiving treatment and 97% of those on treatment had a suppressed viral load. However, the achievement of this target should be interpreted with caution as the elevated proportion of people diagnosed is due to the high number of heterosexual men and women diagnosed in the early 2000s combined with low levels of incidence in this population.

Figure 18: The continuum of HIV care by region of residence and risk group, England: 2016



Part 3: Living with diagnosed HIV infection

Specialist care for HIV is of a very high standard and available free of charge in NHS clinical services across the UK. In 2016, 91,987 people (63,501 men and 28,479 women) living with diagnosed HIV infection received HIV care in the UK. This is a 3% increase on the number seen for care in 2015 (89,289) and a 64% increase on the number a decade ago (55,923 in 2007). This rise is due to effective treatment for HIV.

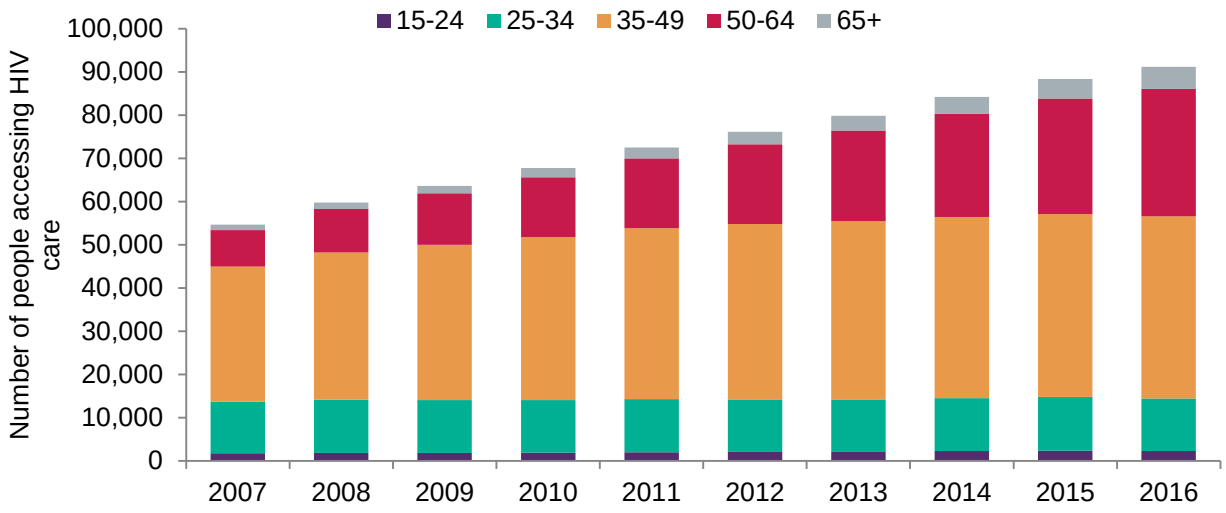
The median age of people accessing care has increased over the past decade, from 40 years in 2007 to 46 years in 2016 (Figure 19a). In 2016, more than a third (38%; 34,735/91,987) of people accessing HIV specialist care were aged 50 years and above; this compares with less than one in five in 2007 (17%; 9,768/55,923).

In 2016, 14% (5,980/42,041) of gay and bisexual men accessing HIV care were from BAME groups, this compares to 12% (2,773/23,806) in 2007 (Figure 19b). Among heterosexuals, although black African men and women make up the greatest proportion of those accessing care in 2016 (58%; 24,449/42,278), one in four (25%; 10,717) heterosexuals was white (Figure 19c), 8% (3,297) were black Caribbean/black other and 4% (1,641) were Asian.

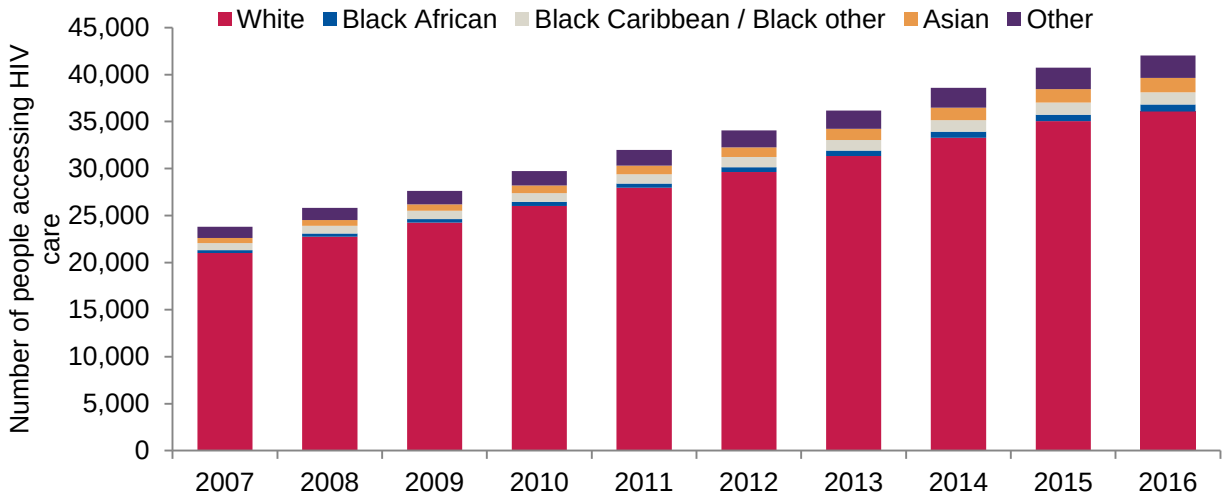
Overall, 79 of 325 local authorities in England had a diagnosed prevalence greater than 2 per 1,000 population aged 15-59 years in 2016 (Figure 20). Of these, 20 had a diagnosed prevalence greater than 5 per 1,000 population aged 15 to 59 years (including 18 London local authorities, Manchester and Brighton and Hove). These are areas in which expanded HIV testing should be implemented (5) and a full list is provided in Appendix 5.

Figure 19: People diagnosed with HIV accessing specialist care, UK, 2007 to 2016

a) By age group



b) Gay and bisexual men, by ethnic group



c) Heterosexual men and women

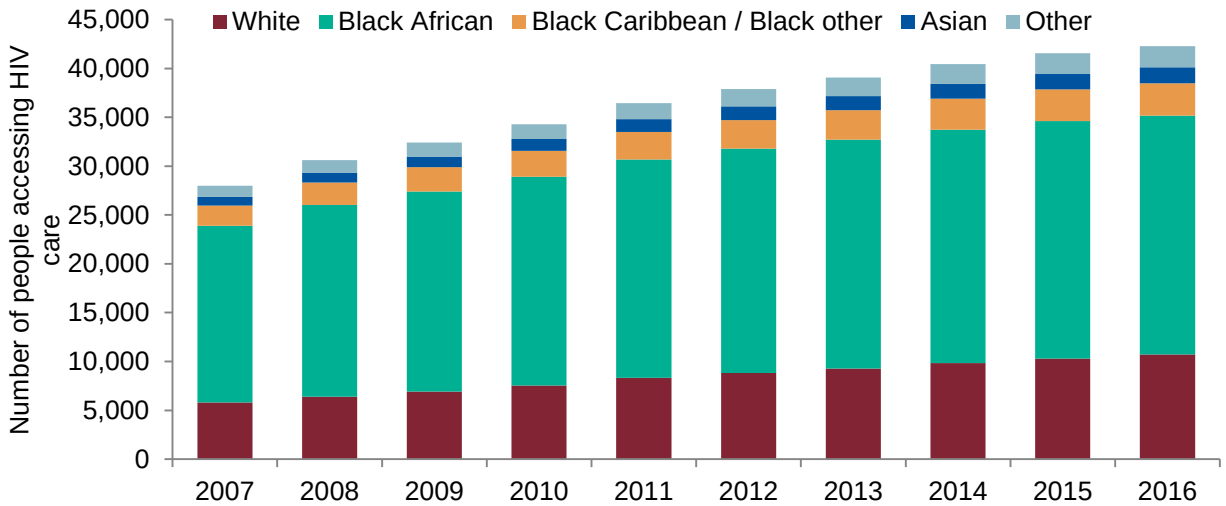
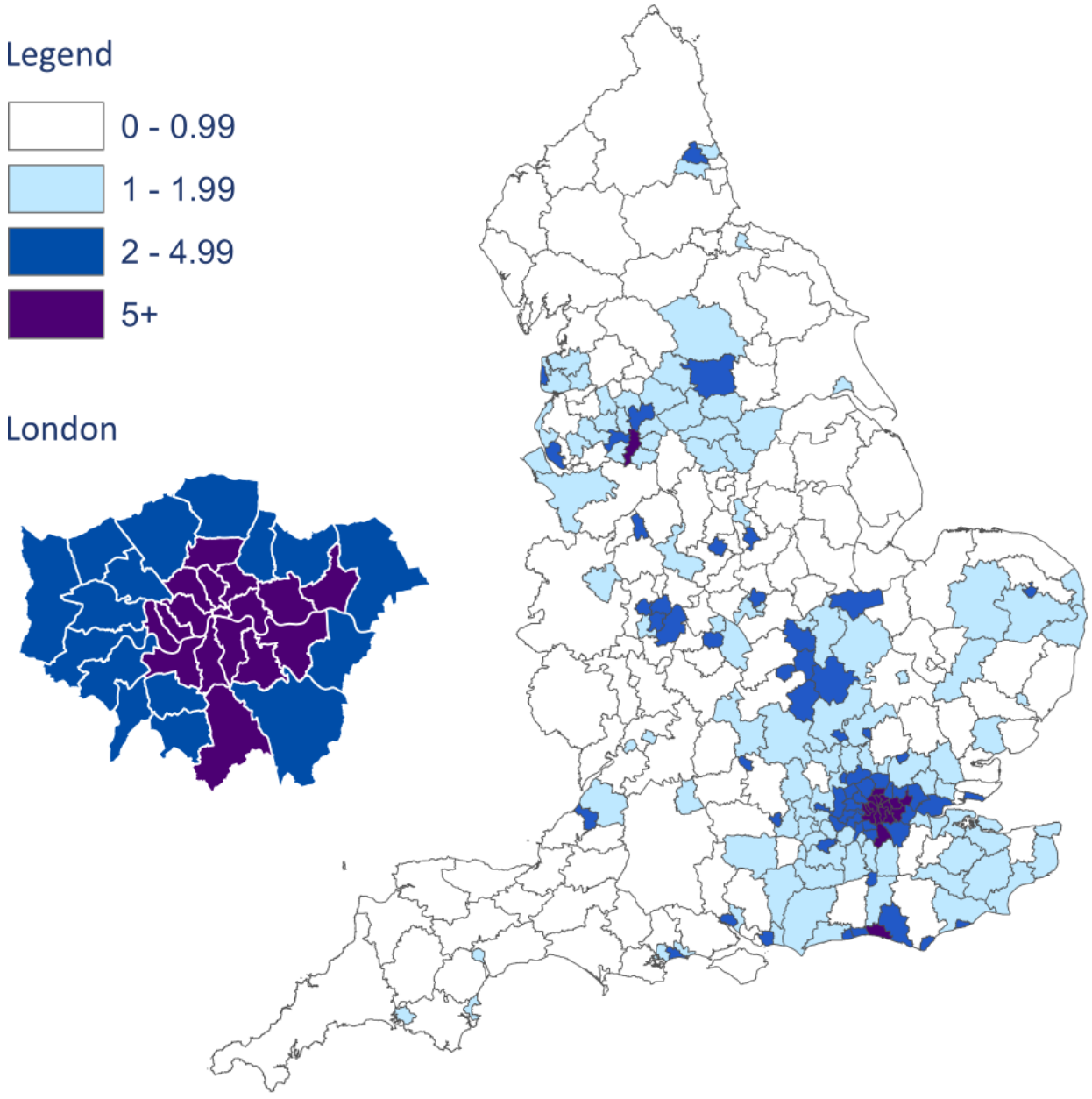


Figure 20: Diagnosed HIV prevalence in England, 2016 (per 1,000 population aged 15 to 59 years



Tuberculosis (TB) and HIV

The most recent year for which TB-HIV co-infection data are available for England is 2015. In this year, 3.8% (211/5,513) of people with TB aged 15 years and older were estimated to also be living with HIV. This is in line with the proportion of people known to be co-infected with HIV in the previous year (2014: 3.3%) and continues the downward trend in co-infections since the peak of 8.4% in 2003.

In 2015, where place of birth was known, 82% (171/209) of people with TB-HIV co-infection were born outside of the UK, the lowest proportion since 2001 (range 2001 to 2014: 83 to 93%). Where country of birth was known, 69% (114/166) of non-UK born people with co-infection were born in sub-Saharan African countries, the lowest number and proportion since 2001 (range 2001 to 2014: 73 to 92%).

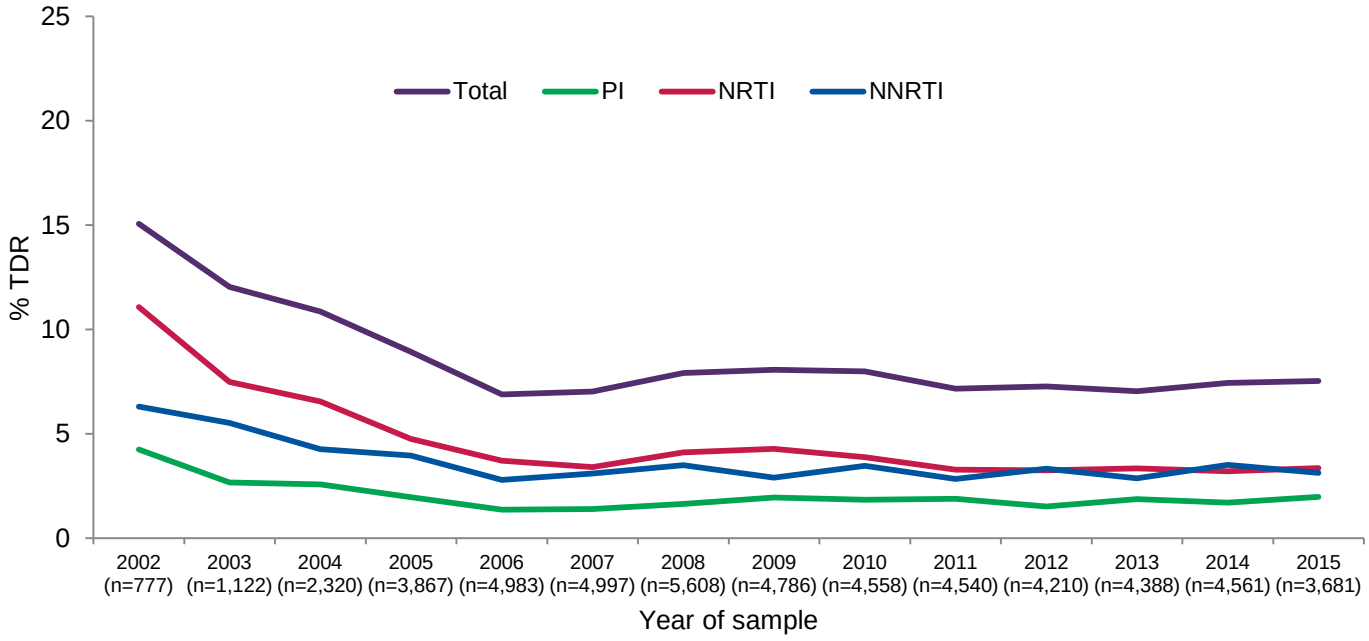
People living with HIV are at increased risk of co-infections related to immunodeficiency. *Mycobacterium tuberculosis* (MTB) remains one of the most common AIDS-defining illnesses in the UK and HIV testing should be one of the routine tests recommended to all those with TB. In addition, British HIV Association recommends testing for people living with HIV if they have a low CD4 count for latent TB infection (LTBI), or if they come from a sub-Saharan country where HIV and TB co-infection is more common (13).

Transmitted drug resistance

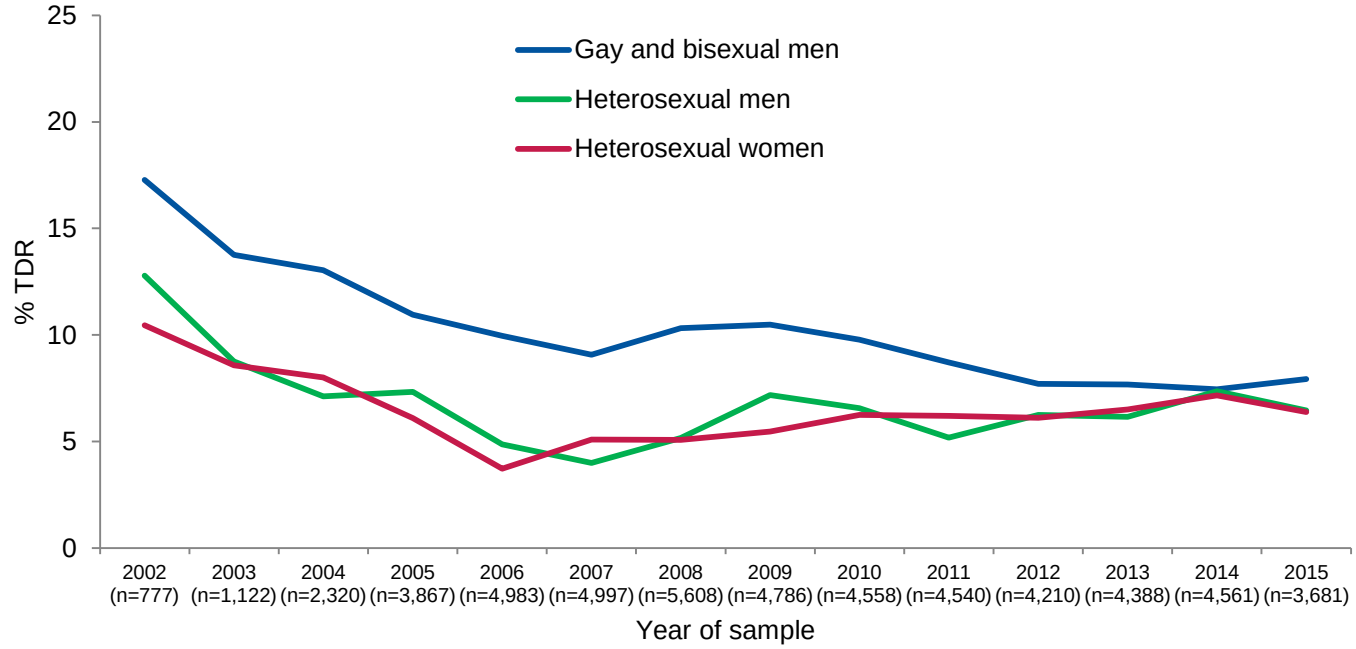
Testing the HIV virus for drug resistance at the time of HIV diagnosis is routinely conducted in the UK. Between 2012 and 2015, the prevalence of transmitted drug resistance (TDR) (defined as the presence of one or more mutations of the HIV virus from the WHO 2009 Surveillance list (14) remained stable and an average of 7.5% of persons tested had detectable drug resistance. Transmitted resistance to the different drug classes remained low and stable with 2.0% of people tested having mutations affecting the protease inhibitor (PI) drug class, 3.4% with mutations affecting the nucleoside reverse transcriptase inhibitor (NRTI) drug class and 3.1% with mutations affecting the non-nucleoside reverse transcriptase inhibitor (NNRTI) drug class in 2015 (Figure 21a). Clinically relevant resistance to currently recommended first line drugs also remained below 10% in 2010 to 2015 (15). In 2015, the prevalence of TDR among gay and bisexual men was very similar to that of heterosexual men and women (Figure 21b).

Figure 21: Proportion of people newly diagnosed who have evidence of transmitted drug resistance: England, 2002 to 2015

a) By drug class



b) By risk group



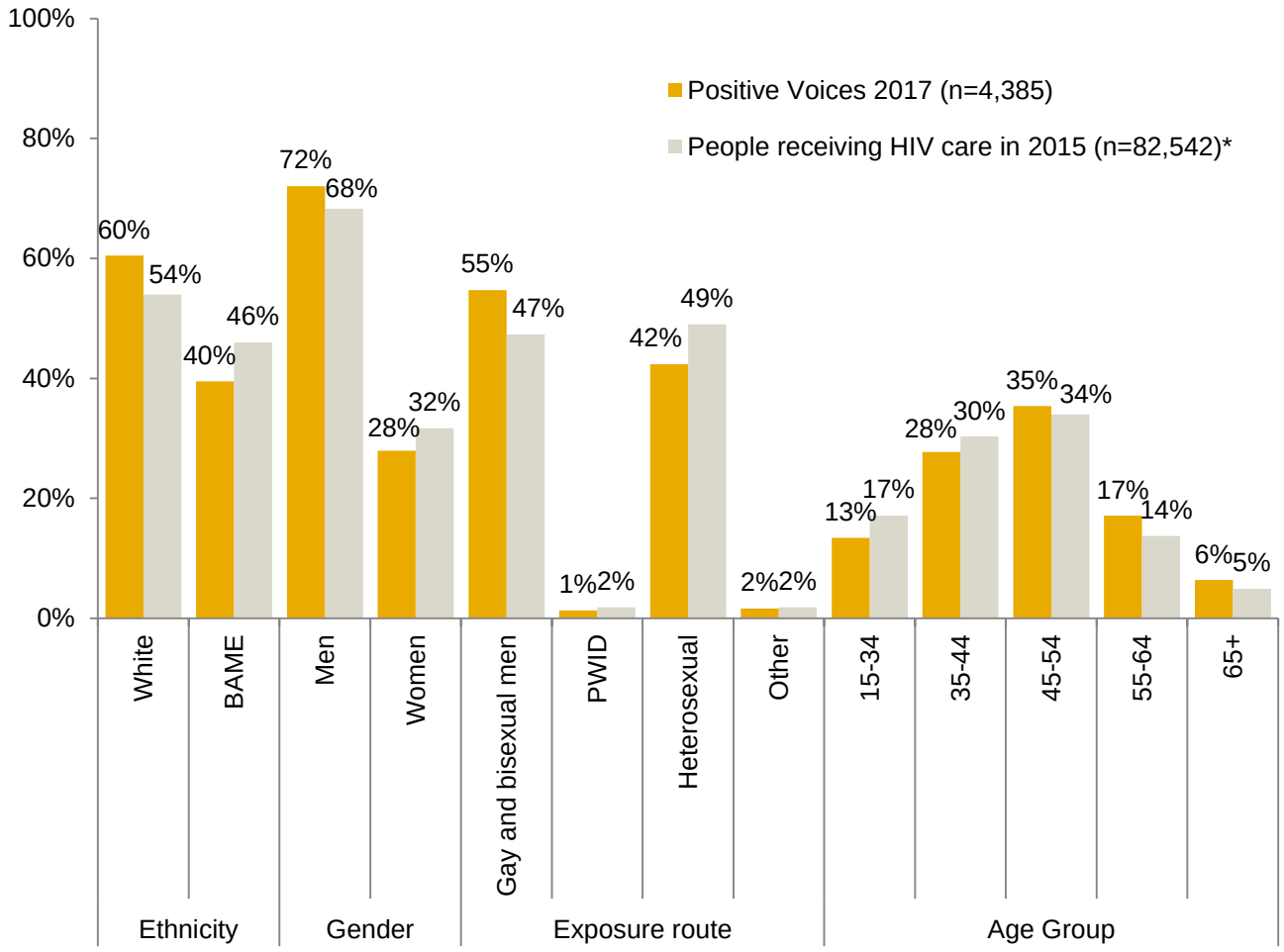
Experiences of living with HIV

In 2017, PHE ran the first round of a national, cross-sectional HIV patient survey ('Positive Voices'), in response to greater recognition of the need to understand the wider health and wellbeing of people living with HIV. Positive Voices uses national surveillance records as a sampling frame to invite a representative sample of people accessing HIV care services to complete a questionnaire on health, comorbidities, lifestyle and met and unmet needs. Survey responses are linked to surveillance data, creating a powerful behavioural and clinical dataset.

Positive Voices represents a step-change in the way national surveillance of HIV is routinely conducted. For the first time, patient-reported experiences will help shape our understanding of the HIV epidemic and the wellbeing of people in HIV care in the UK. Positive Voices will provide valuable population-level estimates of quality of life, health conditions and lifestyle risk behaviours that are generalisable to the population of people accessing HIV care.

Between January and September 2017, 4,400 people with HIV attending 72 participating HIV clinics in England and Wales completed the questionnaire, representing around 5% of all people accessing HIV care. The survey achieved good representation of people living with HIV by gender, age, ethnicity and HIV exposure route (Figure 22). Data will be further weighted to ensure the results are generalisable to the population of people with HIV accessing care. The results will be published in spring 2018.

Figure 22: Representativeness of the characteristics of participants in the 2017 Positive Voices survey, England and Wales, 2015 and 2017



*Aged over 18 and in England and Wales.

Appendices

Appendix 1: Estimated number of people living with HIV (diagnosed and undiagnosed) by exposure group: England[1], 2016

Exposure category	Number diagnosed (credible interval)[2]	Number undiagnosed (credible interval)[2]	Total (credible interval)[2]	% Undiagnosed (credible interval)[2]
Gay and bisexual men	39,900 (39,500, 40,300)	6,100 (4,300, 8,100)	46,000 (44,300, 48,000)	13% (10, 17%)
People who inject drugs	1,400 (1,300, 1,400)	500 (200, 1,900)	1,800 (1,500, 3,200)	25% (12, 58%)
Heterosexuals	35,200 (34,800, 35,500)	3,900 (2,500, 7,900)	39,000 (37,600, 43,100)	10% (7, 18%)
Men	15,600 (15,300, 15,800)	2,500 (1,300, 6,600)	18,000 (16,800, 17,900)	14% (8, 30%)
Black African men	7,800 (7,600-8,000)	1,100 (300, 4,600)	8,900 (8,100, 12,400)	14% (4, 37%)
Men excluding black Africans	7,800 (7,600, 8,000)	1,300 (800, 2,300)	7,700 (7,400, 8,000)	14% (9, 23%)
Women	19,600 (19,300, 19,900)	1,300 (1,000, 1,700)	39,000 (37,600, 43,100)	6% (5, 8%)
Black African women	12,600 (12,400, 12,900)	600 (400, 900)	13,200 (12,900, 13,600)	4% (3, 6%)
Women excluding black Africans	7,700 (7,400, 8,000)	700 (500,1,000)	7,700 (7,400, 8,000)	9% (7, 13%)
Total[2]	**78,900 (78,400, 79,500)**	**10,400 (8,400, 15,700)**	**89,400 (87,200, 94,700)**	**12% (10, 17%)**

[1]Estimates for the UK are scheduled for publication in early 2018. [2]Lower bound, upper bound. [3]Numbers may not add to total due to rounding and exclusion of data relating to HIV acquired through mother-to-child transmission and blood related products.

Appendix 2: Estimated number of people living with HIV (diagnosed and undiagnosed) by exposure group and region of residence: England, 2016

Exposure category	London			Outside London		
	Number undiagnosed (credible interval)[1]	Total (credible interval)[1]	% Undiagnosed (credible interval)[1]	Number undiagnosed (credible interval)[1]	Total (credible interval)[1]	% Undiagnosed (credible interval)[1]
Gay and bisexual men	2,100 (1,800-3,200)	21,400 (20,900, 22,500)	10% (9, 14%)	3,900 (2,300, 5,800)	24,500 (23,000, 26,400)	16% (10, 22%)
People who inject drugs	200 (100, 1,000)	700 (600, 1,500)	24% (10, 64%)	300 (100, 1,000)	1,100 (900, 1,850)	25% (11, 56%)
Heterosexuals	1,400 (600, 3,500)	15,500 (14,700-17,600)	9% (4, 20%)	2,400 (1,600, 4,500)	23,500 (22,600, 25,600)	10% (7, 18%)
Men	900 (300, 3,100)	7,000 (6,400, 9,200)	13% (5, 35%)	1,500 (800, 3,600)	11,000 (10,300, 13,200)	14% (8, 28%)
Black African men	400 (100, 2,000)	3,800 (3,400, 5,400)	12% (2, 38%)	600 (200, 2,600)	5,100 (4,600, 7,100)	13% (7, 37%)
Men excluding black Africans	500 (200, 1,200)	3,100 (2,800-3,900)	14% (6, 31%)	800 (500, ,1600)	5,900 (5,600,6,700)	13% (9, 24%)
Women	400 (300, 600)	8,500 (8,200, 8,800)	5% (3, 7%)	900 (700, 1,300)	12,400 (12,100, 12,900)	7% (5, 10%)
Black African women	200 (100, 400)	5,800 (5,600, 6,000)	4% (2, 6%)	400 (200,600)	7,500 (7,200, 7,800)	5% (3, 8%)
Women excluding black Africans	200 (100, 300)	2,700 (2,600, 3,900)	7% (5, 12%)	500 (400, 800)	5,000 (4,700, 5,300)	10% (7, 15%)
Total[2]	**3,900 (2,700, 6,400)**	**38,700 (37,500, 41,400)**	**10% (7, 16%)**	**6,700 (5,000, 9,400)**	**50,800 (49,000, 53,600)**	**13% (10, 17%)**

[1] Lower bound, upper bound. [2] Numbers may not add to total due to rounding and exclusion of data relating to HIV acquired through mother-to-child transmission and blood related products.

Appendix 3: Number and proportion of likely recently acquired infections at diagnosis (ascertained through the Recent Infection Testing Algorithm) by exposure category and age group: England, Wales and Northern Ireland, 2016[1,2]

Exposure category		15 to 24	25 to 34	35 to 49	50+	Total
Gay and bisexual men	Recent infections	59	154	107	29	348
	Number of samples RITA tested	184	461	424	145	1,214
	%	32%	33%	25%	20%	29%
	(95% C.I.)	(25-39)	(29-38)	(21-30)	(14-27)	(26-31)
Heterosexual men	Recent infections	6	13	18	14	51
	Number RITA tested	16	76	175	130	397
	%	38%	17%	10%	11%	13%
	95% C.I.	(15-65)	(9-28)	(6-16)	(6-17)	(10-17)
Heterosexual women	Recent infections	17	13	17	7	54
	Number RITA tested	46	106	182	94	428
	%	37%	12%	9%	7%	13%
	95% C.I.	(23-53)	(7-20)	(6-15)	(3-15)	(10-16)
All heterosexuals	Recent infections	23	26	35	21	105
	Number RITA tested	62	182	357	244	825
	%	37%	14%	10%	9%	13%
	95% C.I.	(25-50)	(10-20)	(7-13)	(5-13)	(11-15)
Total	Recent infections	84	191	153	61	489
	Number RITA tested	273	722	900	438	2,333
	%	31%	27%	17%	14%	21%
	95% C.I.	(25-37)	(23-30)	(15-20)	(11-18)	(19-23)

[1] Ascertained through the Recent Infection Testing Algorithm (RITA).
[2] Overall, nearly 50% of new HIV diagnoses had a test for recent infection; this was similar across all exposure categories.

Appendix 4: Rates of late diagnosis (CD4 count <350 cells/mm^3) by exposure group, ethnicity and gender: England, 2014 to 2016

Exposure Group	Ethnicity	Gender	Measure	London	Midlands and East of England	North of England	South of England	England total
Gay and bisexual men			Number of diagnoses with CD4 count	3,489	1,128	1,257	1,058	6,932
			Number with CD4 count <350	820	412	479	347	2,058
			% diagnosed late	24%	37%	38%	33%	30%
Heterosexual contact	**Black African**	**Male**	Number of diagnoses with CD4 count	300	246	141	71	758
			Number with CD4 count <350	182	155	106	48	491
			% diagnosed late	61%	63%	75%	68%	65%
		Female	Number of diagnoses with CD4 count	534	376	207	165	1,282
			Number with CD4 count <350	278	177	119	95	669
			% diagnosed late	52%	47%	57%	58%	52%
	White	**Male**	Number of diagnoses with CD4 count	208	237	237	229	911
			Number with CD4 count <350	99	133	136	125	493
			% diagnosed late	48%	56%	57%	55%	54%
		Female	Number of diagnoses with CD4 count	141	219	180	165	705
			Number with CD4 count <350	59	99	84	69	311
			% diagnosed late	42%	45%	47%	42%	44%
	Other	**Male**	Number of diagnoses with CD4 count	225	103	73	48	449
			Number with CD4 count <350	136	57	44	29	266
			% diagnosed late	60%	55%	60%	60%	59%
		Female	Number of diagnoses with CD4 count	242	149	76	78	545
			Number with CD4 count <350	120	73	31	45	269
			% diagnosed late	50%	49%	41%	58%	49%
People who inject drugs			Number of diagnoses with CD4 count	63	71	32	48	214
			Number with CD4 count <350	34	33	20	26	113
			% diagnosed late	54%	46%	63%	54%	53%

Appendix 5: Local authorities with diagnosed HIV prevalence rates above 2 per 1,000 population[1]: England, 2016

HIV prevalence category	Local authority name	Residents accessing HIV related care (aged 15 to 59)	Estimated resident population in 1,000s[2] (15 to 59)	Diagnosed HIV prevalence per 1,000 (aged 15 to 59)
5+	Lambeth	3,940	237.01	16.62
	Southwark	2,517	222.1	11.33
	City of London	72	6.41	11.23
	Kensington and Chelsea	964	101.33	9.51
	Camden	1,529	166.76	9.17
	Westminster	1,438	170.18	8.45
	Brighton and Hove	1,587	196.1	8.09
	Hammersmith and Fulham	996	123.57	8.06
	Lewisham	1,625	204.09	7.96
	Hackney	1,489	191.25	7.79
	Islington	1,302	169.71	7.67
	Tower Hamlets	1,452	220.03	6.60
	Haringey	1,219	189.99	6.42
	Manchester	2,352	369.51	6.37
	Greenwich	1,149	181.87	6.32
	Newham	1,455	232.59	6.26
	Barking and Dagenham	769	125.7	6.12
	Wandsworth	1,212	221.12	5.48
	Croydon	1,249	233.88	5.34
	Waltham Forest	874	179.49	4.87
2 to 4.99	Brent	916	210.69	4.35
	Salford	665	154.56	4.30
	Merton	550	130.48	4.22
	Enfield	855	203.48	4.20
	Luton	550	132.83	4.14
	Blackpool	317	78.78	4.02
	Leicester	865	221.02	3.91

[1] Complete list of diagnosed HIV prevalence rates available from: www.gov.uk/government/statistics/hiv-annual-data-tables
[2] Population data from Office for National Statistics mid-2016 population estimate.

HIV prevalence category	Local authority name	Residents accessing HIV related care (aged 15 to 59)	Estimated resident population in 1,000s[2] (15 to 59)	Diagnosed HIV prevalence per 1,000 (aged 15 to 59)
	Ealing	815	215.8	3.78
	Hounslow	643	173.2	3.71
	Northampton	475	136.66	3.48
	Reading	360	104.9	3.43
	Slough	303	90.98	3.33
	Coventry	726	223.15	3.25
	Wolverhampton	487	150.85	3.23
	Bournemouth	383	122.69	3.12
	Crawley	205	68.53	2.99
	Milton Keynes	470	158.81	2.96
	Nottingham	642	217.57	2.95
	Barnet	684	237.75	2.88
	Southend-on-Sea	296	103.14	2.87
	Birmingham	1968	689.88	2.85
	Watford	169	60.16	2.81
	Harlow	142	50.7	2.80
	Sandwell	524	190.78	2.75
	Redbridge	498	185.25	2.69
	Stevenage	141	52.77	2.67
	Hillingdon	492	188.36	2.61
	Bromley	497	191.54	2.59
	Leeds	1249	484.46	2.58
	Sutton	315	122.34	2.57
	Bexley	369	145.41	2.54
	Bristol, City of	748	295.38	2.53
	Derby	376	152.59	2.46
	Worthing	148	60.1	2.46
	Richmond upon Thames	284	118.07	2.41
	Hastings	126	52.77	2.39
	Harrow	351	149.9	2.34
	Bedford	230	98.25	2.34
	Eastbourne	129	55.32	2.33
	Woking	134	57.62	2.33
	Wellingborough	100	43.72	2.29
	Southampton	370	167.75	2.21

HIV prevalence category	Local authority name	Residents accessing HIV related care (aged 15 to 59)	Estimated resident population in 1,000s[2] (15 to 59)	Diagnosed HIV prevalence per 1,000 (aged 15 to 59)
	Kingston upon Thames	246	112.33	2.19
	Thurrock	218	100.09	2.18
	Lewes	115	53.01	2.17
	Stoke-on-Trent	319	148.4	2.15
	Newcastle upon Tyne	413	192.18	2.15
	Walsall	340	159.35	2.13
	Hertsmere	126	59.25	2.13
	Oxford	233	111.15	2.10
	Norwich	190	91.55	2.08
	Liverpool	646	311.92	2.07
	Peterborough	241	117.12	2.06
	Kettering	116	56.56	2.05
	Adur	70	34.24	2.04
	Rochdale	256	126.13	2.03
	Portsmouth	279	138.31	2.02
	Havering	294	146.89	2.00
	Spelthorne	115	57.56	2.00

Appendix 6: List of data sources and associated measures

Data source	Description	Geographical coverage	Measures
HIV and AIDS Reporting System (HARS)	National HIV surveillance: Linked dataset of people newly diagnosed and seen for HIV care, includes the Recent Infection Testing Algorithm and CD4 surveillance scheme. (www.gov.uk/government/collections/hiv-surveillance-data-and-management)	National, England, Wales and Northern Ireland (RITA)	New HIV and AIDS diagnoses, recent infection, late HIV diagnoses, one-year mortality, people seen for HIV care, linkage to HIV care, retention in HIV care, treatment coverage, virological suppression, diagnosed HIV prevalence
Multi-parameter Evidence Synthesis (MPES)	Bayesian multi-parameter evidence synthesis model, reviewed each year to take into account changes in data sources(16, 17)	National, England and Wales, London	Diagnosed and undiagnosed HIV prevalence among the general population and key groups
CD4 back-calculation model	CD4-based Bayesian back-calculation model (6)	England	Undiagnosed HIV prevalence and incidence among gay and bisexual men
Probable country of acquisition	CD4 decline model to estimate country of infection for those born abroad (18)	National	Probable country of acquisition by exposure group
UK HIV Drug Resistance Database	Molecular surveillance dataset with sequence data for transmitted drug resistance (www.hivrdb.org.uk)	National	Transmitted drug resistance by drug class and exposure group
Enhanced Tuberculosis Surveillance System	Laboratory isolates and case notifications for TB cases (www.gov.uk/government/collections/tuberculosis-and-other-mycobacterial-diseases-diagnosis-screening-management-and-data)	England, Wales and Northern Ireland	Tuberculosis incidence among people living with HIV
National Study of HIV in Pregnancy and Childhood	Data on pregnant women living with HIV and their children from the Institute of Child Health (www.ucl.ac.uk/nshpc)	National	Mother-to-child transmission of HIV
Office for National Statistics	Population data (www.ons.gov.uk)	National	UK population, mortality rates

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