Frequently asked questions about HIV risk and infectiousness.

In May 2014, HIV Prevention England (HPE) launched an instalment of the 'It Starts With Me' campaign that promotes condoms by focusing on the HIV risk presented by undiagnosed infection. Through adverts, a leaflet, an animated film clip and messages on social media, the two target audiences (African people and gay and bisexual men) will be encouraged to think about HIV risk and the protection condoms offer. Campaign messages deal with undiagnosed infection, increased infectiousness during the early stage of infection and how treatment reduces transmission risk.

What is this document for?

HPE local delivery partners will raise these issues with their audiences through one-to-one or group interventions and events. This document answers a call from some partners for a briefing to help workers and volunteers to answer questions they may be asked. Its content is compliant with the Information Standard* and it is hoped that it will help to provide consistent messages and advice to our target audiences.

*The Information Standard is a quality control programme commissioned by NHS England for providers of health and care information, of which Terrence Higgins Trust and other HPE partners are members. It guarantees that information provided to the public to make health care decisions is fully evidenced, accurate and up-to-date.

Undiagnosed infection
1. 'How common is it for people to have HIV and not know?'

Among Africans in the UK who have HIV, around in one in four (23%) do not realise they have it (21% for African women, rising to 27% for men). Of gay and bisexual men with HIV, around one in five (18%) do not know that they have it.

This means that over 7,000 Africans and a similar number of gay and bisexual men are believed to have undiagnosed HIV. These figures come from Public Health England (PHE) who estimate levels of undiagnosed infection from anonymous samples from, among other sources, people attending sexual health clinics or pregnant women [1].

Most people with HIV who do not know they have it feel perfectly fine for many years. On average a gay man will have HIV for over three years before he is diagnosed - he will not usually have spent this time feeling ill [2]. Many African people remain undiagnosed for even longer [3]. Most people with undiagnosed HIV actually believe themselves to be HIV negative [4] [5].
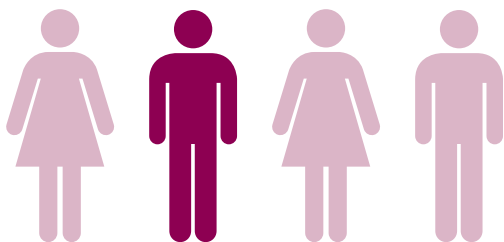
1 in 4 Africans with HIV don't know they have it

1 in 5 gay and bisexual men with HIV don't know they have it

2. 'Is it really true that most people get HIV from someone who does not know they have it?'

This is based on studies across the world that have found the majority of new infections come from people who have not been diagnosed.

Using available data, PHE estimates that up to eight in 10 new infections among British gay and bisexual men come from people who are unaware they are infected [6]. No figures exist for Africans but as studies of heterosexuals in general conclude that the majority of new infections also come from the undiagnosed [7], it is safe to assume that this also applies to African people in Britain.

Recent ('primary' or 'acute') infection

3. 'How many new HIV infections come from people who have been infected recently?'

The lowest estimate is that around one in 10 new infections come from people who are recently infected (ie, they have only had HIV for a few weeks). The highest estimate is that half of new infections come from them.

Studies of couples where one has HIV and the other does not have observed when the other partner gets infected. This is matched against blood samples taken at regular intervals that measure 'viral load' (how much HIV is in the infected partner's body). From this we can see when infections are most likely to happen. Some studies show that fewer than one in 10 infections come from people who were recently infected and that most infections come from people who have had HIV for a number of years [8]. Other studies suggest that up to half of new infections may come from the recently infected [9], [10], [11]. The latter seems more likely for gay and bisexual men because of their closely connected sexual networks and greater numbers of partners [12]. This means they are more likely to have sex with someone who was recently infected and therefore very infectious.

4. 'Why are people who are recently infected more likely to pass on HIV? How much bigger is the risk?'

How infectious someone is depends on how high their viral load is. Viral load, and therefore infectiousness, peaks within the first six weeks or so of getting HIV.

Infectiousness is linked to 'viral load'. This is a measurement of how much HIV is in the blood of someone with the virus but it is also a good guide to how much is in their semen, pre-cum, vaginal fluid or anal mucus*. The higher their viral load, the more likely they are to pass on HIV during unprotected sex. Viral load peaks within the first six weeks or so of getting HIV, so this is when someone is at their most infectious [13], [14]. It is also before the body produces antibodies** to HIV. Because the person's immune system has not yet started to try to control the virus, nothing is stopping HIV from reproducing. This allows levels of the virus to become extremely high very quickly. After two to four weeks the immune system begins to fight the virus, makes antibodies and the amount of virus starts to fall to a lower level of infectiousness.

Although the very high peak is over within the first six weeks or so, the period of raised infectiousness that follows can last a further month or two until eventually viral load settles at a lower level (where it can stay for many years). Even with this lower level of viral load, a person remains infectious (unless they start treatment). Some studies show that recently infected people might be as high as 16 [15] or even 26 times [16] more likely to infect others in the first few weeks after getting infected. The early phase of HIV is called 'primary' or 'acute' infection and usually refers to a range of events that happen within the first six months, with the peak in infectiousness occurring within the first six or so weeks.

*The coating inside the anus.
** Antibodies are made by the immune system to identify and fight an infection. Antibodies against HIV are not able to fight off HIV long term.

Typical timeline of infection*

Day one: HIV enters the body.

Week one: the virus is not usually detectable in the bloodstream [17].

By week two: the virus is now in the bloodstream and multiplying rapidly [18].

Between weeks two to four: viral load and infectiousness reach their peak - the viral load can reach several million copies/ml [19].

Weeks two to four: the immune system begins to fight back and antibodies to HIV are produced. At this point most people get a seroconversion illness lasting up to two weeks - symptoms include fever, body rash and sore throat [20].

By the end of week four: infection can usually be detected by a fourth generation HIV test [21] - ie, a test that looks for antibodies to HIV and the HIV antigen.**

Within two to three months: the viral load has dropped to a level at which it is likely to remain for many years [22]. The person remains infectious.

*Timescales will differ between individuals.
** Not all HIV tests are fourth generation tests. Third generation tests, sometimes used in community testing, only look for antibodies so can take longer than four weeks to detect a recent infection.

Typical pattern of infectiousness in early stage infection
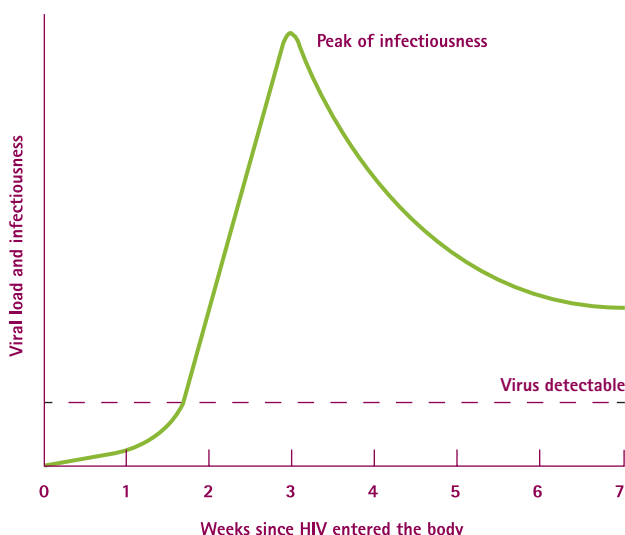
5. 'What are the exact figures for the risk when someone is recently infected and very infectious?'

It is very difficult to work out the exact and definite risks of HIV being passed on, but there are estimates which help us to understand how risk increases according to viral load.

For heterosexuals:

One study into the HIV risk from vaginal sex with different viral loads gave these estimates [23]:

Viral load	Infection risk per sex act
Very high: 1 million copies/ml	One in 147
High: 100,000 copies/ml	One in 416
Low: 1,000 copies/ml	One in 3,571

For anal sex between men:

One possible 'worst case scenario' risk estimate is as follows:

A man with HIV ejaculating inside an HIV negative man is the highest risk sex act. With an average viral load, the highest risk estimate for this act is 1.4% (or a one in 70 risk) [24]. If we multiply this by the highest estimates for increased infectiousness during the early stage of HIV infection (ie, a 26 times greater risk) [25], it gives us an extremely high likelihood of HIV being passed on. The risk is now not 1.43% but 37%, which translates to a more than a one in three chance of getting HIV.

These estimates help to convey the scale of increase of risk during early infection. Estimates of risk per sex act cannot be taken as precise and may appear low so could encourage risk-taking. **For these reasons, we do not advise using these figures in discussions with members of the public.**

6. 'Won't an HIV test show if someone has recently become infected and is very infectious?'

No, for the first four weeks after becoming infected an HIV test can give a 'false negative' result. This is despite the fact that the person does now in fact have HIV and is extremely infectious.

Someone is most infectious in the first few weeks after getting infected before their body starts to produce the signs of infection that an HIV test looks for. These signs are antibodies to HIV and/or antigens (a protein produced by HIV). During the first four weeks after infection a person can get a 'false negative' result when tested, at the very time when they have the highest levels of the virus in their body and are most infectious [26]. People will not usually realise they have HIV during this highly infectious period. If they were to test using a standard HIV test (fourth generation tests that look for both HIV antibodies and antigens), most people would not test positive until at least four weeks after getting infected. Third generation tests, sometimes used for testing in the community, can take longer than four weeks to detect a recent infection [27].

Effect of HIV treatment on infectiousness

7. 'Just how low is the risk of sex without a condom with someone on HIV treatment?'

The answer is 'extremely low' so long as certain important conditions are met.

Sexual transmission risk is related to how much HIV is in blood, semen, pre-cum, vaginal fluid and anal mucus. This is usually measured with a test on someone's blood (a 'viral load' test). HIV treatment stops the virus from reproducing itself, dramatically lowering viral load [28]. The aim of treatment is to reduce the viral load to 'undetectable' levels which means there is still HIV present but at very low levels. This is usually defined as under 50 copies/ml but some very sensitive tests can measure below 20 copies/ml. Most people whose blood test is 'undetectable' also have undetectable levels of HIV in their semen, pre-cum, vaginal fluid or anal mucus. But sometimes viral load can be higher in these sexual fluids than in the blood [29], [30].

There can also be a short-lived rise in viral load which might push up the risk of transmission, eg, when someone has a sexually transmitted infection (STI) or a woman is having her period [31], [32].

We do not yet know if there is a level of viral load below which transmission is no longer possible. The risk is lower with a low viral load compared to a high viral load but HIV can still be passed on when viral load is low (ie, under 10,000 copies/ml). This risk may go up if someone has an STI.

HIV risk is at its lowest when viral load is undetectable. If someone is on HIV treatment, there is an **extremely low** risk of them passing HIV on to a partner through unprotected vaginal or anal sex as long as:

- Neither partner has an STI and
- The HIV positive partner has had a stable undetectable viral load, which has been undetectable for at least six months.

The British HIV Association (BHIVA) and the Expert Advisory Group on AIDS (EAGA) recommended that in health messages the words used to describe this risk should be 'extremely low' [33].

There have been a very small number of cases where people with undetectable viral loads (who are free of STIs) appear to have infected others [34]. However, in general, infections appear unlikely once the viral load falls below 1,500 copies/ml [35]. A previous study [36] of over 1,700 mostly heterosexual couples, over almost two years, found early treatment reduced transmission risk by at least 96%. This does not mean this left a 4% risk of infection: it means the already relatively small risk of transmission was reduced by 96%.

An ongoing study [37] of over 1,000 heterosexual and gay male couples covering over 30,000 vaginal and anal sex acts has so far failed - over two years - to identify a single case of transmission from a partner on treatment with an undetectable viral load (despite quite high levels of STIs in these couples). Although the researchers have not ruled out that they may discover later in the study that a risk does exist, they have said they currently believe the risk is probably near to zero. The study is still ongoing and a more definite answer will be known when its final results are available in 2017.

8. 'If HIV treatment stops people with HIV being infectious, why do we need to use condoms?'

Very many people with HIV are still infectious. And many people with HIV do not know they have it, so are not on treatment. If you do not use condoms you risk getting HIV from them.

Looking at people with HIV only six in 10 of them has an undetectable viral load. This leaves over 40,000 people with HIV in Britain who are still infectious.

These are individuals who either:
- Do not realise they have HIV so will not be on treatment (this is almost a quarter of all people with HIV).
- Know they have HIV but have not started treatment (mainly because they do not yet need to).
- Are on treatment but are not yet undetectable - mainly because they have not been on treatment long enough - or, for a minority, because they never will become undetectable [38].

Treatment cascade: United Kingdom, 2012
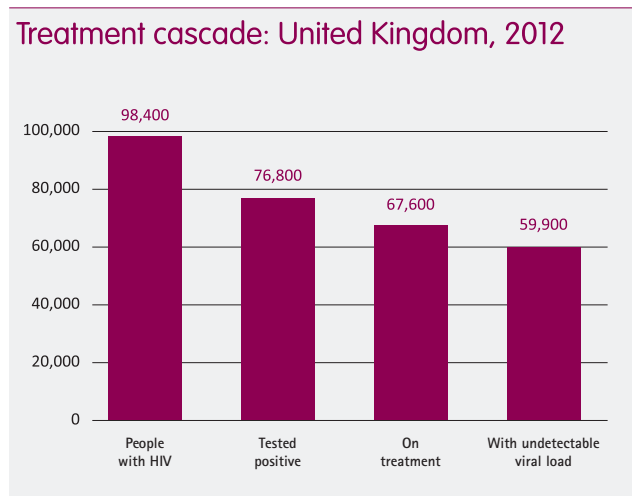
Source: Public Health England

9. 'Are you saying it is safe to have sex without a condom with an HIV positive person on treatment? Is this not an irresponsible message?'

Our message remains that unless you are totally certain of your partner's HIV status, the safest thing is condom use with everyone. This is especially important with casual partners and at the start of a new relationship before you both test together.

However, people with HIV are already using their viral load to make decisions about risk and condom use, including with their HIV negative partners. More and more our target audiences will need to understand infectiousness, viral load and the impact of treatment.

We are not advocating condomless sex with people with undetectable viral load but presenting the facts as we currently know them. This way people can make more informed decisions for themselves, hopefully after also discussing the issue with an HIV doctor. That said, expert opinion has judged the risk of transmission to be extremely low if a person on treatment has undetectable viral load and is free of STIs.

In fact, because condoms can break or come off during sex, unprotected sex with someone with undetectable viral load is probably safer than:

- Sex with a condom with a person who might have undiagnosed infection, especially recent infection.
- Sex with a condom with an HIV positive person not on treatment and/or with detectable viral load.

In both cases, condom failure can expose the negative partner to HIV. Condom failure is significant among gay men and especially high among African people (30% of Africans report this in the previous year) [39], [40]. Condoms used 100% of the time, though not perfectly (ie, with usual rates of breakage and slippage), provide protection of 80-85% against HIV [41]. HIV treatment on the other hand is estimated to reduce the risk by at least 96% [42]. BHIVA and EAGA have said that effective antiretroviral therapy is as effective as consistent condom use in preventing infection [43].

We present our messages about risk and undetectable viral load alongside messages that stress the need for condoms to protect against the risk from people with undiagnosed infection. We also stress that HIV treatment, unlike condoms, provides no protection against other STIs or an unplanned pregnancy.

10. 'Why does the risk of infection become extremely low only after six months of being "undetectable" and not as soon as a person starts treatment?'

It can take six months for HIV drugs to bring the viral load down to undetectable levels. After these first six months it is unlikely to go up again unless the person stops taking their treatment.

It takes several months for levels of HIV medication to reach sufficient levels in the body to achieve a long-lasting undetectable viral load [44]. After six months, blood tests will confirm whether this has been achieved - a minority of people will never have an undetectable viral load. Most people who become undetectable stay that way. Studies show that after six months the chances of viral load rising and becoming detectable again are low (and become even lower over time). In one study after the initial six months on treatment only around 1% of people became 'detectable' again during the next six months. Only 0.6% became detectable again after that and just 0.03% of people on treatment for five years or longer ever became detectable again [45].

Risk and HIV prevalence

11. 'How likely am I to have sex with someone with HIV?'

If you have sex with a gay or bisexual man or someone from an African community there is a significant chance that this person could have HIV.

In Britain the highest levels of HIV are found among gay and bisexual men and in black African communities. Levels vary between different groups within each community - for example some African nationalities have higher rates than others [46]. In gay and bisexual men rates are higher in big cities and in certain age groups. Figures from Public Health England based on anonymous testing among, for example, pregnant women and people attending sexual health clinics show:

- In the general UK population around **one in 665** people have HIV [47].
- Among UK Africans around **one in 27** has HIV [48].
- Among gay and bisexual men around **one in 20** have HIV [49]. This rises to well over **one in 10** in men on the gay scenes of some cities [50].

Of African people with HIV about **one in 4** of them do not know that they have it. Of gay and bisexual men with HIV around **one in 5** do not realise that they are infected [51].

African people, and gay or bisexual men, have quite a high chance of having sex with someone from their community who is HIV positive - and the likelihood that their partner will not realise they have HIV is also high.

MOST gay men get HIV from a guy who DOESN'T KNOW he has it

That's why I use condoms

So if a guy tells you he is HIV negative, he could be wrong.

Get your FREE condom sampler pack while stocks last:

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IT STARTS WITH ME

Someone who's recently got HIV is VERY INFECTIOUS and won't know

That's why I use condoms

So if someone tells you they are HIV negative, they could be wrong.

Get your FREE condom sampler pack while stocks last:

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IT STARTS WITH ME

Gay and African posters from the May 2014 It Starts With Me condom campaign

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