HIV and Aids

Key Terms

- **HIV**: Human Immunodeficiency Virus, a virus that causes an incurable infection transmitted by sexual activity, contaminated needles, infected blood or from mother to child, which attacks the body's immune system.
- **AIDS:** Acquired Immunodeficiency Syndrome, an advanced stage of HIV infection where the immune system is greatly weakened and other infections appear because of this.
- **Immune system:** The body's natural defense system against disease.

What's all the fuss about?

HIV/Aids cannot be cured, though with the right treatment people can live for many years after infection, with few symptoms and side effects of the treatment. The main way of transmitting HIV is through sexual relations.

The question of how to prevent HIV is often controversial. In much of the world, treatment is hard to come by and expensive. Even where effective prevention and treatment are available, people may become exposed to HIV because they don't understand the risk, or they are socially vulnerable. Finally, stigma and discrimination of people living with HIV is still widespread, as often they are marked out as being different and are blamed for that difference.

Statistics[1]

- **34.2 million:** The number of people in the world living with HIV in 2011.
- **7000:** the number of new infections diagnosed every day around the world.
- **30 million:** The number of people who have died from AIDS since its discovery in 1981.

[1] Sources: WHO http://www.who.int/mediacentre/factsheets/fs360/en/index.html and www.unaids.org/documents/20101123_FS_nawe_em_en.pdf

Science Q&A

What is HIV?

HIV, or Human Immunodeficiency Virus, is a virus that attacks the body's immune system.

It replicates by getting into cells in the patient's body and inserting chunks of its own genetic code into the DNA in those cells, in order to instruct them to make new viruses. The new viruses can then infect other cells.

HIV infection through sex

90% of HIV infections in the UK are from sex, of which around half are between a man and a woman, and around half are between two men.

In the case of HIV, the main type of cells which get infected are cells which help the body fight against disease. This leads to the patient having a weakened immune system. If HIV is left untreated, AIDS will usually develop. This is an advanced state of the HIV infection where the patient can die of other infections or cancers because the immune system is not strong enough to fight them off.

How do people get infected with HIV?

There are three main ways people get infected with HIV:

HIV infection through drug use

In the UK, 5% of HIV infections are from drug users sharing needles to inject drugs. In Eastern Europe, this figure rises to 44%.

Sexual transmission: In Europe, HIV is most often spread through unprotected sex. Bodily fluids like semen, blood and vaginal fluid can transmit the HIV virus into the bloodstream of a sexual partner.

Transmission through the blood: If the HIV virus is present in the blood it can be transmitted when infected blood enters into the uninfected bloodstream. This can be from drug users sharing needles, a blood transfusion using infected blood, a tattoo or piercing where the needle is contaminated or when infected blood comes into contact with an open wound.

Mother to child: A woman with HIV who gets pregnant can transmit the virus to her child during pregnancy or during the delivery itself.

How do people live with HIV?

There is no cure. At the moment, the only treatment is a combination of anti-HIV drugs. These drugs slow down the development of the disease by targeting the virus while it replicates, limiting various stages of its life cycle.

HIV transmission between men

Data from 23 European countries show that the annual number of HIV diagnoses among men who have sex with men rose by 86% between 2000 and 2006.

HIV multiplies very quickly, and can also become resistant to drugs. This is why we use a combination of drugs, to make it harder for the virus to replicate. Then new, resistant variants of the virus are less likely to appear. If patients stick carefully to their treatment, they can keep the virus levels in their blood so low that they may be undetectable for years.

People living with HIV take a number of tablets every day. They are encouraged to exercise, eat healthily, stop smoking and have regular vaccinations to minimise the risk of getting serious illnesses.

How can HIV transmission be prevented?

In Europe, public awareness campaigns about HIV usually focus on preventing sexual transmission by using condoms where the HIV status of the partner is unknown, and getting people tested for HIV so they know their status. Screening blood for HIV before blood transfusions and using disposable syringes are two ways to prevent transmission into the bloodstream.

Many HIV prevention methods use anti-HIV treatment to decrease the chance of HIV transmission:

- **Lowering the viral load:** People living with HIV often take treatment for their own health. Anti-HIV treatment decreases the amount of the virus in a person's bodily fluids, known as the 'viral load', thereby making them less likely to get AIDS-related illnesses. An HIV-positive person's viral load is the single biggest risk factor in the transmission of HIV. So taking treatment has the additional benefit of significantly decreasing this risk. The idea of 'treatment as prevention' is to use treatment as a prevention strategy that people could use to protect their sexual partners, or, on a large scale, to reduce HIV transmission among a population.
- **Prevention of mother-to-child transmission**: Across the world, HIV-positive pregnant women take anti-HIV drugs to reduce the chances of transmitting the virus to their babies. Without intervention there is a 20-45 percent chance that a baby born to an HIV-infected mother will become infected. Treatment for the mother during pregnancy significantly reduces this risk.

- **Post exposure prophylaxis**: After a risk of exposure to HIV, through sex or through contact with HIV-infected blood, patients can receive an emergency anti-HIV treatment called PEP. This is usually a 4-week course of anti-HIV drugs. It must begin within 72 hours of the risk of infection. PEP reduces the chances of infection by around 80%, although it is expensive as a treatment and can have side effects.

What research is being conducted into prevention and treatment?

Prevention:

- New technologies such as **microbicides** (gels, creams or sprays capable of killing the virus) are continually being tested to see how well they prevent HIV being passed on through sex.
- Researchers are also working on a **vaccine** which could prevent people from becoming infected.
- Another possible prevention technique being researched is **pre-exposure prophylaxis**. This involves providing people who are not infected with HIV with anti-HIV drugs before possible exposure to the virus, to stop them from becoming infected. It has the potential to be useful for couples where only one partner is living with HIV. But it could also be used as a prevention method for people at high risk.

Treatment: Researchers are looking for ways to either treat HIV infection so that it disappears all together, or to minimize the infection. The most promising strategies being investigated are:

- **Gene therapy** – modifying patients' immune systems to make them resistant to HIV infection.
- **Treatment optimization and intensification** – stopping the virus replicating any further.
- **Immune-based therapies and reversal of HIV latency** – stimulating the body's immune system and making dormant HIV-infected cells detectable to the immune system.
- **Therapeutic vaccination** – improving the patient's immune response and allowing control over HIV at low levels.

Discussion Continuum

This activity is designed to facilitate dialogue about the ethical, legal and social aspects of research into HIV and Aids. Groups of 4-12 students discuss the issues raised by each statement and choose where each card should go between 'agree' and 'disagree'.

Contents:

- An AGREE and a DISAGREE card
- 8 Discussion Cards, which include a statement on some aspect of HIV and Aids

Gameplay:

1. Players form small groups, between 4 and 12 per group. Each group is given an AGREE and DISAGREE card and 8 discussion cards.
2. Within each group, the AGREE card and DISAGREE card are placed on the floor/table about one metre apart, to represent the two extremes of the continuum. The space in between is where the discussion cards will be placed.
3. The first player reads the first discussion card to the rest of the group. The player should check everyone understands the card, and use information from the introduction where necessary to ensure the group understands the statement.
4. The first player then decides to what extent they agree with the first card. They place the card face up, anywhere on the discussion continuum, closer to AGREE or DISAGREE as they choose. This is entirely the choice of the individual player, and is not discussed by the group. The player can give a reason, if they wish.
5. Each player in turn then reads a card, checks that everyone understands, and chooses individually where to place it on the continuum in a similar way.
6. When all the cards have been read, understood and placed on the continuum, the discussion begins. The aim is to place the cards between AGREE and DISAGREE in an order that most of the players agree on. Players should pick a card for discussion, and discuss whether to move it.
7. At the end of the discussion, each group should have a continuum which they mostly agree with.
8. If several groups are playing at the same time, the facilitator may wish to bring the different groups' results together. Are they similar? Can someone from each group explain their choices on particular cards?

Adapting the game:

Time limitations? Don't hesitate to reduce the number of cards, or simply use the cards as starting points for discussion.

Discussion continuum developed by Ecsite, in collaboration with Barcelona Science Park, in the context of the Xplore Health project. Thanks to At-Bristol for the development of the discussion continuum format: www.at-bristol.org.uk

Agree

Disagree

Discussion Card 1

"Men who have sex with men should **not be allowed to donate blood**, to minimise the risk of HIV transmission."

Discussion Card 2

"Public health campaigns should **spread the message that condoms are not the only way to decrease the risk of HIV transmission:** reducing the viral load in people living with HIV also reduces risk, for example."

Discussion Card 3

"When applying for a job as a doctor or nurse, **no-one should be obliged to disclose their HIV status**, even if their work involves a risk of transmission."

Discussion Card 4

"If an effective vaccine is developed against HIV, **as much money as possible should be spent ensuring it gets to people most in need,** even if this means that fewer people can be vaccinated."

Discussion Card 5

"Doctors should **recommend abstinence** (not having sex) as a good way of preventing HIV transmission among young people."

Discussion Card 6

"**Giving out free, clean syringes** to known drug users is a good way for health authorities to reduce the transmission of HIV by sharing needles."

Discussion Card 7

"**Doctors should be allowed to disclose a patient's HIV+ status** to their HIV- sexual partner if it is clear that there is a risk the partner could become infected."

Discussion Card 8

"**Pregnant women should be obliged to have an HIV test** to ensure doctors can prevent the baby being infected."

Discussion Card 9

"**Emergency PEP treatment for HIV infection should not be widely advertised** to the public, because it may encourage people to take risks, knowing they can start the treatment the day after."