

AIDS trends: how come the controversy?

Jonathan Cowie

Sir. Sir. Is there really an AIDS risk for western heterosexuals?

Introduction

Worldwide, the commonest way HIV is transmitted is heterosexually. As the World Health Organization points out (WHO, 1993a), the worst affected area is sub-Saharan Africa (with over 8 million estimated to be infected with HIV (as opposed to having AIDS)). Here the principal mode of transmission is heterosexual. Worldwide, WHO estimates that over 15 million people have been infected (WHO, 1993b), the clear majority heterosexually, and it predicts that this figure will rise by the year 2000 to between 30 and 40 million. Yet in the UK up to October 31st 1993, of the 8252 cases of AIDS only 10.6 per cent appear to have acquired the virus heterosexually (Anon, 1993/4). Similarly, throughout Western Europe and in North America, heterosexual transmission of HIV accounts for less than half of AIDS cases! (Indeed, in Western Europe, heterosexual transmission only tops 40 per cent in Belgium, and everywhere else it is below 30 per cent.) 'So', enquires your class, 'why all the fuss about heterosexual transmission?'

Epidemiology

Human ecology is not always simple. A western class addressing the popularly perceived HIV transmission paradox can begin to understand the rudiments behind epidemiological studies. To begin with, to unravel the paradox, its logic must be addressed. Just because in our country HIV is transmitted predominantly in one way does not mean that this is necessar-

ily the case everywhere. With this in mind, epidemiologists consider HIV's biology to gain an understanding of how it spreads through a specific population.

The AIDS virus (HIV) is successful in at least one respect; it does not kill its (adult) host before it has had a chance to be passed on to new hosts. The key factor here is the lengthy latency period when the infected host exhibits no outward symptoms. We now know that about ten years pass between infection and the average onset of AIDS. For the epidemiologist studying the spread of a new disease this presents three clear problems:

1. That it takes years before the true pattern of spread within a population emerges.
2. The lack of early symptoms means that without medically screening (for seroconversion) the population, it is difficult to ascertain what is going on.
3. Because of the above two, early predictions regarding the future course of the disease are less certain.

As time passes, epidemiologists learn about the way HIV is spreading, and, indeed, about the changing pattern of spread. Opportunistic screening for HIV can take place (for example, when blood is given for donation, or when patients attend Sexually Transmitted Disease (STD) clinics, albeit for non-HIV treatment). Also, the data gained from the first two problems above can then be used to enhance subsequent future forecasts.

The forecasts themselves, while becoming increasingly accurate, are not perfect, but projections of future trends are obviously required if we are to plan for health-care strategies. The latest projections for England and Wales suggest that the incidence of *new* AIDS cases per year will have increased from a little over 1.3 thousand in 1991 to somewhere between 1.7 and 2.7 thousand in 1996, with a 'best-guess' of just over 2.0 (Anderson, 1993). This has a sizeable window for error.

Abstract

There is a popular public misconception in the UK that HIV is not predominantly readily transmitted heterosexually. Because of reports in the so-called quality press, teachers could well find themselves confronting such misconceptions in the classroom. However, the historic and current statistics of HIV infection reveal a different story.

Key words HIV, AIDS, Epidemiology, Perception.

So if predictions are difficult, just how do epidemiologists make them? Methods include extrapolation, and complex mathematical models that attempt to represent the various ways the virus is transmitted within, and between, the various higher risk groups. In the case of AIDS with its lengthy incubation time, a refinement is added to the above. Since the number of AIDS cases now reflects the pattern of HIV infection in the past, it is possible, using individual case histories and from cohort studies, to back-calculate the number of people infected with HIV during each time period and to then extrapolate forward.

Forecasting

The use of back-calculation is revealing. Indeed, one can intuitively calculate what the *general* trends of UK HIV infection must have been in the past, as a class exercise, given a few basic facts:

- the annual rate of increase (October 1993) of AIDS cases is about 20 per cent;
- a total of 8252 cases were reported to the end of October 1993 of which 6133 were thought to have been contracted homosexually, but only 877 heterosexually;
- over the *two* consecutive 12-month periods up to October 1992, the number of new cases attributed to heterosexual transmission increased by 29 per cent, whereas over the same periods the growth in new cases acquired homosexually increased by 16 per cent (Cowie, 1993a).

These figures indicate that there is an *increase* in the growth of heterosexually acquired cases, but a *decline* in the growth of homosexually acquired cases. It reflects a change in the way the disease (HIV) is being spread.

Official back-calculations for England and Wales bear this out. They reveal that the incidence of *new* HIV infections among homosexuals and bisexuals peaked at around 4.8 thousand per year in 1983 before declining. On the other hand, the back-calculated incidence of new HIV infections acquired heterosexually has been slowly increasing in a logistic way, overtaking the declining homosexual/bisexual incidence in 1986 and rising to nearly 1.8 thousand per year in 1991 (see figure 1).

There are three possible reasons why the back-calculated incidence of new HIV cases peaked and then declined: a) the smaller homosexual population could have become more saturated with HIV infection making it harder for new infection to occur; b) behavioural change in the light of health awareness; c) it is some artefact of the assumptions used in the official back-calculations. In reality, the first two factors are likely, and the third (we hope) unlikely, assuming that the epidemiologists got their maths right.

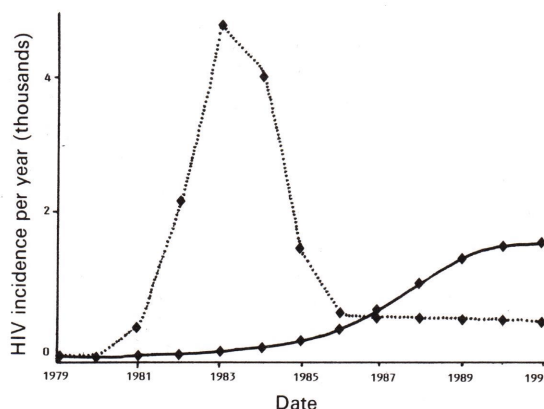


Figure 1 Back-calculated estimated annual incidence of new HIV infection in England and Wales. Homosexual/bisexual men = dotted line; heterosexuals = solid line. (After Anderson, R. (1993).)

Heterosexual transmission

The above provides real cause for concern over the future rate of heterosexual transmission of AIDS in the UK. But what of funding? True, UK spending on AIDS awareness has indeed been high, including the delivery of leaflets to UK households, and advertising in the national press and on TV. However, because the current rate of UK heterosexual transmission is low (as mentioned at the beginning of this article), does this mean that the money has been badly spent?

While it is difficult to correlate specific promotional campaigns with behavioural change, the argument surely must be that the UK *does* have a low rate of heterosexual transmission. Furthermore, in terms of the cumulative incidence of AIDS cases (no matter how acquired) per million head of population at the end of 1992, the UK fares well especially when compared with countries (such as Spain (see table 1)) which have spent little on AIDS awareness.

Media perception

However, the above biological appreciation of AIDS epidemiology is not accepted by everyone, including

Table 1 Cumulative AIDS incidence per million head of population (up to 1993) in various countries, and percentage contracted heterosexually (POST, 1993)

United States	970	6.7%
Spain	475	6.4%
Switzerland	439	14.6%
France	425	12.1%
Italy	291	7.4%
United Kingdom	127	10%
Belgium	136	43.5%
Denmark	227	11.9%
The Netherlands	170	7.5%

AIDS trends: how come the controversy Cowie

some sectors of the media. In 1990, this journal reported how *The Sun* (the largest circulating 'popular' UK newspaper) ran a headline 'Straight sex cannot give you AIDS—official', though Britain's Press Council subsequently censured the paper (Cowie, 1990).

By 1993, some of the UK 'quality' press had also taken up a stance contrary to the accepted biological view. Currently, both *The Sunday Times* and *The Sunday Telegraph* are consistently reporting that AIDS is not caused by HIV, citing the views of the scientist Peter Duesberg, who is well known for his dissent from the general opinion that AIDS follows HIV infection.

Duesberg's case ultimately rests on the lack of direct experimental evidence that AIDS results from HIV infection, as nobody without the virus has been biologically isolated, injected with HIV, and subsequently developed AIDS—it is unlikely that such an experiment will ever be conducted. Duesberg believes that drug-taking (and some medications) may cause AIDS. Contrary to the belief of many who do not subscribe to the HIV hypothesis, Duesberg's views have been published in peer-reviewed journals. While he is technically correct in asserting that direct experimental evidence is preferential to indirect, as well as circumstantial evidence, there is such a body of evidence indicating that HIV is causally related to AIDS that it would be foolish to ignore it. Furthermore, accepting the HIV hypothesis does provide a preventive course of action which, when adopted, works (Cowie, 1993b).

As long as some members of the press continue to promote views that are at best considered radical, and at worst incorrect and misleading, it is likely that these will surface in classroom discussions on AIDS. Biology teachers could well find themselves steering a vigorous debate.

References

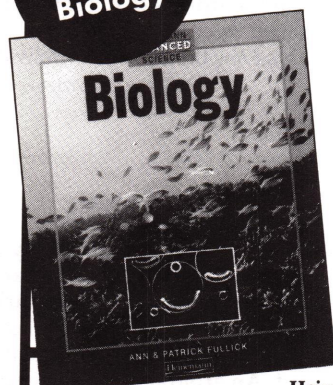
- Anderson, R. (1993) AIDS: trends, predictions, controversy. *Nature*, **363**, 393–394.
- Anon (1993/4) Latest UK figures on AIDS. *The AIDS Letter*, Dec./Jan., p. 7. London: Royal Society of Medicine.
- Cowie, J. (1990) AIDS and education—an update. *Journal of Biological Education*, **24**(4), 259–261.
- Cowie, J. (1993a) AIDS: Education update 1993. *Offshoots*, Spring. London: Institute of Biology.
- Cowie, J. (1993b) Wrong ideas. *Nature*, **365**, 202.
- POST (1993) *Heterosexual AIDS. Information for Members*. Briefing Note 46. London: Parliamentary Office of Science and Technology.
- World Health Organization (1993a) *WHO estimate of HIV infection tops 14 million*. Press Release WHO/38. Geneva: WHO.
- World Health Organization (1993b) *1.5 million new HIV infections in Africa pushes global total to over 15 million*. Press Release WHO/101. Geneva: WHO.

The author

Jonathan Cowie works with various bodies, to promote the understanding and appreciation of science. He is also Head of Books at the Institute of Biology.

Teachers
of A-Level
Biology

Why choose *Heinemann Advanced Science: Biology?*



- It is specifically written for students with a GCSE balanced science background, helping them to make up ground between the end of their GCSE course and the requirements of a single-subject A-Level.
- While it is accessible for the full range of A-Level candidates, there is plenty of material to stretch your very able students, allowing them to achieve the highest grades.
- It gives completely up-to-date coverage of the new A-Level subject core and the major syllabuses in effect from September 1994.

Please complete the coupon below and return it to:
Inspection Department, Heinemann Educational,
FREEPOST, Oxford OX2 8BR Tel: (0865) 314333

Heinemann

Heinemann Advanced Science: Biology Request Form

Please send me an inspection copy of
☐ **Biology** Available now
435 57079 X £18.95

Also available:

☐ **Physics** June 1994
435 57078 I £18.95

☐ **Chemistry** Summer 1994
435 57080 3 £18.95

Prices are provisional until publication.

Name

Position

School/College

Address

Postcode

For the purpose of the Data Protection Act 1984, Heinemann Educational is collecting this information on behalf of Reed International Books Limited.

S 406 HBI AJ