

The Durban Declaration

Nature 406, 15-16 (6 July 2000)

A Declaration by Scientists and Physicians Affirming HIV is the Cause of AIDS

Seventeen years after the discovery of the human immunodeficiency virus (HIV), thousands of individuals from around the world are gathering in Durban, South Africa, to attend the XIII International AIDS Conference, which starts next week (9 July). At the turn of the millennium, figures released last week reveal that an estimated 34.3 million people worldwide are living with HIV or AIDS, 24.5 million of them in sub-Saharan Africa (1). Last year alone, 2.8 million people died of AIDS, the highest rate since the start of the epidemic. If current trends continue, southern and Southeast Asia, South America and regions of the former Soviet Union will also bear a heavy burden in the next two decades.

AIDS spreads by infection, like many other diseases, such as tuberculosis and malaria, that cause illness and death particularly in underprivileged and impoverished communities. HIV-1, which is responsible for the AIDS pandemic, is a retrovirus closely related to a simian immunodeficiency virus (SIV) that infects chimpanzees. HIV-2, which is prevalent in West Africa and has spread to Europe and India, is almost indistinguishable from an SIV that infects sooty mangabey monkeys. Although HIV-1 and HIV-2 first arose as zoonoses (2) — infections transmitted from animals to humans — both now spread among humans through sexual contact; from mother to infant; and via contaminated blood.

An animal source for an infection is not unique to HIV. The plague came from rodents and influenza from birds. The new Nipah virus in Southeast Asia reached humans via pigs. Variant Creutzfeldt–Jakob disease in the United Kingdom is identical to 'mad cow' disease. Once HIV became established in humans, it soon followed human habits and movements. Like many other viruses, HIV recognizes no social, political or geographic boundaries.

The evidence that AIDS is caused by HIV-1 or HIV-2 is clear-cut, exhaustive and unambiguous, meeting the highest standards of science (3-7). The data fulfil exactly the same criteria as for other viral diseases, such as polio, measles and smallpox:

- Patients with acquired immune deficiency syndrome, regardless of where they live, are infected with HIV. (3-7)
- If not treated, most people with HIV infection show signs of AIDS within five to ten years. (6, 7) HIV infection is identified in blood by detecting antibodies, gene sequences or viral isolation. These tests are as reliable as any used for detecting other virus infections.
- People who received HIV-contaminated blood or blood products develop AIDS, whereas those who received untainted or screened blood do not. (6)

- Most children who develop AIDS are born to HIV-infected mothers. The higher the viral load in the mother, the greater the risk of the child becoming infected. (8)
- In the laboratory, HIV infects the exact type of white blood cell (CD4 lymphocytes) that becomes depleted in people with AIDS. (3-5)
- Drugs that block HIV replication in the test tube also reduce virus load in people and delay progression to AIDS. Where available, treatment has reduced AIDS mortality by more than 80%. (9)
- Monkeys inoculated with cloned SIV DNA become infected and develop AIDS. (10)

Further compelling data are available (4). HIV causes AIDS (5). It is unfortunate that a few vocal people continue to deny the evidence. This position will cost countless lives.

In different regions of the world, HIV/AIDS can show altered patterns of spread and symptoms. In Africa, for example, people infected with HIV are 11 times more likely to die within five years (7), and more than 100 times more likely than uninfected people to develop Kaposi's sarcoma, a cancer linked to yet another virus (11).

As with any other chronic infection, various factors have a role in determining the risk of disease. People who are malnourished, who already suffer other infections or who are older, tend to be more susceptible to the rapid development of AIDS following HIV infection. However, none of these factors weakens the scientific evidence that HIV is the sole cause of the AIDS epidemic.

In this global emergency, prevention of HIV infection must be our greatest worldwide public-health priority. The knowledge and tools to prevent infection are available. The sexual spread of HIV can be stopped by mutual monogamy, abstinence or by using condoms. Blood transmission can be prevented by screening blood products and by not reusing needles. Mother-to-child transmission can be reduced by half or more by short courses of antiviral drugs (12-13)

Limited resources and the crushing burden of poverty in many parts of the world constitute formidable challenges to the control of HIV infection. People already infected can be helped by treatment with life-saving drugs, but the high cost of these drugs puts these treatments out of reach for most of the world. It is crucial to develop new antiviral drugs that are easier to take, have fewer side effects and are much less expensive, so that millions more can benefit from them.

There are many ways of communicating the vital information on HIV/AIDS, and what works best in one country may not be appropriate in another. But to tackle the disease, everyone must first understand that HIV is the enemy. Research, not myths, will lead to the development of more effective and cheaper treatments, and, it is hoped, a vaccine. But for now, emphasis must be placed on preventing sexual transmission.

There is no end in sight to the AIDS pandemic. But, by working together, we have the power to reverse its tide. Science will one day triumph over AIDS, just as it did over

smallpox. Curbing the spread of HIV will be the first step. Until then, reason, solidarity, political will and courage must be our partners.

References

1. Joint United Nations Programme on HIV/AIDS (UNAIDS) Report on the Global HIV/AIDS Epidemic, June 2000 (UNAIDS, Geneva, 2000). [1]
2. Hahn, B. H. , Shaw, G. M. , De Cock, K. M. & Sharp, P. M. AIDS as a zoonosis: scientific and public health implications. *Science* 287, 607–614 (2000). [2]
3. Weiss, R. A. & Jaffe, H. W. Duesberg, HIV and AIDS. *Nature* 345, 659–660 (1990). [3]
4. NIAID HIV as the Cause of AIDS [4]
5. O'Brien, S. J. & Goedert, J. J. HIV causes AIDS: Koch's postulates fulfilled. *Curr. Opin. Immunol.* 8, 613– 618 (1996). [5]
6. Darby, S. C. et al. Mortality before and after HIV infection in the complete UK population of haemophiliacs. *Nature* 377, 79–82 (1995). [6]
7. Nunn, A. J. et al. Mortality associated with HIV-1 infection over five years in a rural Ugandan population: cohort study. *Br. Med. J.* 315, 767–771 (1997). [7]
8. Sperling, R. S. et al. Maternal viral load, zidovudine treatment, and the risk of transmission of human immunodeficiency virus type 1 from mother to infant . *N. Engl. J. Med.* 335, 1678– 1680 (1996). [8]
9. Centers for Disease Control and Prevention (CDC) HIV/AIDS Surveillance Report 1999 11, 1–44 (1999). [9]
10. Liska, V. et al. Viremia and AIDS in rhesus macaques after intramuscular inoculation of plasmid DNA encoding full-length SIVmac239. *AIDS Res. Hum. Retroviruses* 15, 445–450 (1999). [10]
11. Sitas, F. et al. Antibodies against human herpesvirus 8 in black South African patients with cancer. *N. Engl. J. Med.* 340, 1863–1871 (1999). [11]
12. Shaffer, N. et al. Short course zidovudine for perinatal HIV-1 transmission in Bangkok Thailand: a randomised controlled trial. *Lancet* 353, 773–780 (1999). [12]
13. Guay, L. A. et al. Intrapartum and neonatal single-dose nevirapine compared with zidovudine for prevention of mother-to-child transmission of HIV-1 in Kampala, Uganda: HIVNET 012 randomised trial. *Lancet* 354, 795–802 (1999). [13]