

ABC of HIV and AIDS

SIXTH EDITION

Edited by Michael W. Adler, Simon G. Edwards, Robert F. Miller,
Gulshan Sethi and Ian Williams



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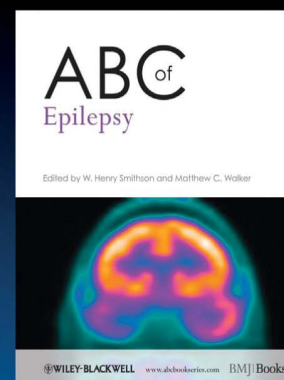
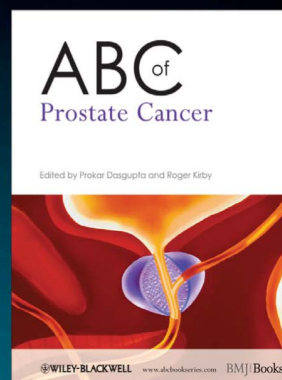
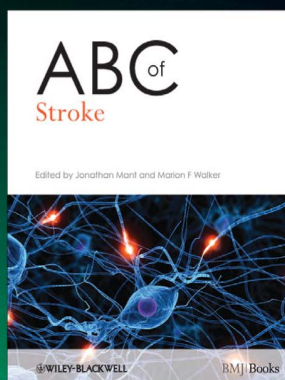
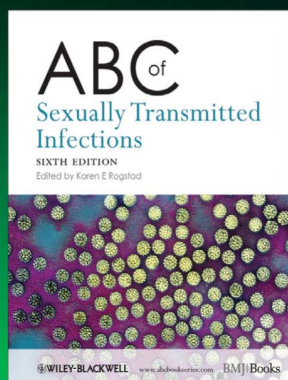
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Preface

It is now over 30 years since the first recognized cases of AIDS were reported in the USA. There are estimated to be over 30 million persons living with HIV worldwide. Closer to home, the Health Protection Agency estimated that the number of individuals living with HIV in the UK will exceed 100 000 for the first time in 2012. There have been major advances in HIV therapy and where access to appropriate treatment and care is available, the clinical picture has evolved from a terminal illness to a manageable life-long chronic condition. In resource rich settings the major cause of death is due to the sequelae of late diagnosis. In the UK, it is estimated that a quarter of individuals with HIV are unaware of their infection. In addition, approximately half continue to be diagnosed with HIV at a late stage of infection. Early diagnosis of HIV is paramount, delivering both individual health gains, i.e. prevention of opportunistic infections with associated morbidity and mortality, and public health benefits in the prevention of HIV transmission through behaviour modification.

Following HIV diagnosis in the UK, we can be reassured that the quality of HIV care received is high. Based on London data,

80% of newly diagnosed patients were seen in an HIV clinic within 1 month of diagnosis; 90% had an undetectable viral load (less than 50 copies/mL) 1 year after starting therapy; and 93% of those in care for more than a year had a CD4 count above 200 cells per mm³. Antiretroviral regimens have become more convenient to take with the advent of coformulated medications and greater tolerability. HIV-infected patients spend most of their time out of hospital and in the community. It is likely that primary care will play a greater role in the testing and subsequent management of HIV-infected individuals.

The aim of the sixth edition of the *ABC of HIV/AIDS* is to provide those healthcare professionals not routinely dealing with HIV-infected patients to develop an up-to-date knowledge base and feel more skilled and comfortable about caring for these patients.

This revised edition not only contains updated chapters but has new sections which reflect the latest recommendations on HIV testing, routine monitoring, antiretroviral treatment and the patient's perspective.

CHAPTER 1

Development of the Epidemic

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OVERVIEW

- The commonest mode of transmission of the virus is through sexual intercourse
- The growth of the epidemic has appeared to stabilize
- HIV continues to exert a huge public health and economic burden
- In 2009, there were 33.3 million people living with HIV worldwide
- Sub-Saharan Africa has experienced a disproportionate burden of the global HIV epidemic
- 10 million people who are eligible for treatment under World Health Organization guidelines are still in need of treatment

Development of the epidemic (Boxes 1.1 and 1.2)

The first recognized cases of the acquired immune deficiency syndrome (AIDS) occurred in the summer of 1981 in the USA. Reports began to appear of *Pneumocystis carinii* (now known as *jirovecii*) pneumonia and Kaposi sarcoma in young men, who it was subsequently realized were both homosexual and immunocompromised. Even though the condition became known early on as AIDS, its cause and modes of transmission were not immediately obvious. The virus, human immunodeficiency virus (HIV), now known to cause AIDS in a proportion of those infected, was discovered in 1983. Subsequently a new variant has been isolated in patients with West African connections, HIV-2.

Thirty years on and with the introduction of combination antiretroviral therapy (cART), where it is widely available, the clinical picture of HIV has changed from a fatal illness to that of a chronic condition. There has been an increase in the number of people living with diagnosed HIV as a result of fewer deaths from AIDS and ongoing high rates of HIV diagnosis. In developed countries, where cART has been available from its inception, an ageing cohort is now seen, and people with HIV are living near-normal

life expectancies. Consequent to this has arisen the challenges of managing the co-morbidities associated with age and the long-term consequences of cART. Despite this, more than 10 million people worldwide who require cART are not able to access it, and HIV continues to exert a huge public health and economic burden. The last decade has seen consistent global efforts to address health, development and the HIV epidemic, starting with the United Nations (UN) Millennium Development Goals (MDGs). Despite extensive progress, many countries have failed to achieve MDG Six, which is in part to halt and reverse the spread of HIV (Box 1.2)

Box 1.1 Early history of the HIV epidemic

- 1981 Cases of *Pneumocystis carinii* pneumonia and Kaposi sarcoma in the USA
- 1983 Virus discovered
- 1984 Development of the antibody test
- 1987 Introduction of zidovudine therapy
- 1995 Formation of United Nations Programme on AIDS (UNAIDS)
- 1996 Introduction of highly active antiretroviral therapy (HAART)
- 2003 The '3 by 5' campaign is launched to widen access to treatment

Box 1.2 HIV epidemic – the bottom line

UN Millennium Development Goal Six

- Target **6A**. Have halted by 2015 and begun to reverse the spread of HIV/AIDS
- Target **6B**. Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it.

'Growth in investment for the AIDS response has flattened for the first time in 2009. Stigma, discrimination, and bad laws continue to place roadblocks for people living with HIV and people on the margins . . . This new fourth decade of the epidemic should be one of moving towards efficient, focused and scaled-up programmes to accelerate progress for Results. Results. Results'

Michel Sidibé, Executive Director UNAIDS, UNAIDS Report on the Global AIDS Epidemic 2010

Transmission of the virus (Box 1.3)

HIV has been isolated from semen, cervical secretions, lymphocytes, cell-free plasma, cerebrospinal fluid, tears, saliva, urine and breast milk. This does not mean, however, that these fluids all transmit infection, as the concentration of virus in them varies considerably.

Box 1.3 Transmission of the virus

Sexual intercourse

- anal
- vaginal
- oral

Contaminated needles

- intravenous drug users
- needlestick injuries

Mother to child

- *in utero*
- at birth
- breastfeeding

Tissue donation

- blood transfusion
- organ transplantation

Particularly infectious are semen, blood and possibly cervical secretions. Infection can occur after mucosal exposure to infected blood or body fluids.

The commonest mode of transmission of the virus throughout the world is through sexual intercourse. Unprotected anal and vaginal intercourse carry the highest risk of transmission, and the promotion of condom use has been the focus of prevention efforts.

Transmission also occurs through the sharing or reuse of contaminated needles by injecting drug users, which continues to drive the epidemic in Eastern Europe.

Transmission from mother to child occurs *in utero*, during labour and through breastfeeding. Transmission rates can be between 15%

and 45% without intervention, and less than 5% with effective interventions. Mother-to-child transmission (MTCT) of HIV still significantly contributes to child mortality worldwide. However, the increase in access to services for preventing MTCT has led to fewer children being born with HIV. Use of cART during pregnancy, and at the time of birth, has been the mainstay of intervention strategies (see Chapters 17 and 18). In the UK, universal antenatal screening and access to cART have virtually eliminated MTCT. Globally, an estimated 370 000 children were newly infected with HIV in 2007, a fall of 24% from 5 years previously. UNAIDS called for the elimination of new paediatric HIV infections by 2015. It recommends that countries adopt a policy that HIV-positive mothers or their infants take ART while breastfeeding to prevent HIV transmission.

Contaminated blood products have previously contributed to the transmission of HIV, but universal screening has almost eliminated this mode of transmission in developed countries. Healthcare workers can rarely be infected through needlestick injuries and skin and mucosal exposure to infected blood or body fluids.

Growth and size of the epidemic (Table 1.1, Figure 1.1)

The growth of the epidemic has appeared to stabilize. Globally, there are fewer AIDS-related deaths and a steady decline in the number of new HIV infections since the late 1990s. In 2009, there were 33.3 million people living with HIV. There were 2.6 million new infections, which is 21% fewer than in 1997 (3.2 million) when the number of new infections reached its peak. HIV remains undiagnosed in 40% of people. The HIV incidence in 33 countries has fallen by 25% between 2001 and 2009, with 22 of these countries being in sub-Saharan Africa. However, in seven countries there has been an increase of more than 25% in the same time period. These include five countries in Eastern Europe and Central Asia.

Even though North America and Europe experienced the first impact of the epidemic, infections with HIV are now seen throughout the world, and the major focus of the epidemic is in resource-poor countries.

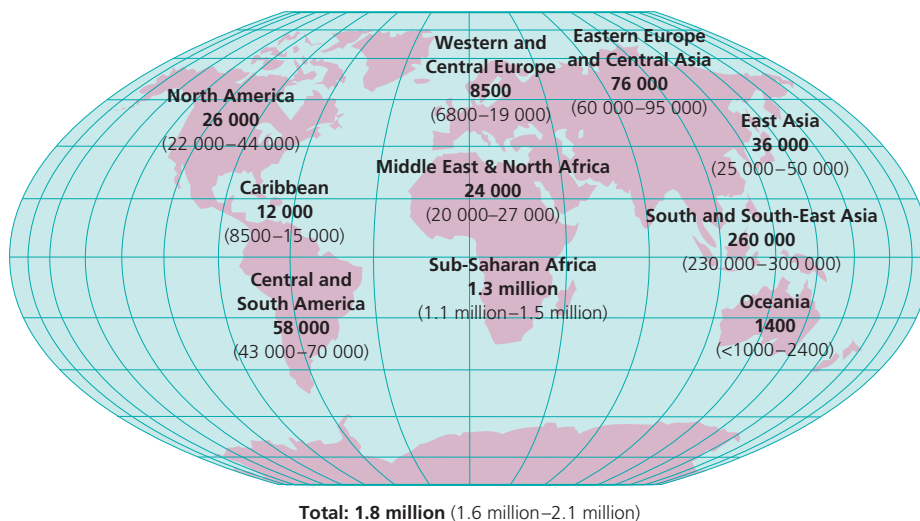


Figure 1.1 Estimated adult and child deaths from AIDS, 2009. Source: UNAIDS, UNAIDS Report on the Global AIDS Epidemic 2010.

Table 1.1 Regional HIV and AIDS statistics 2009.

	Adults and children living with HIV	Adults and children newly infected with HIV	Adult prevalence (15–49 years) (%)	Adult & child deaths due to AIDS
Sub-Saharan Africa	22.5 million (20.9 million–24.2 million)	1.8 million (1.6 million–2.0 million)	5.0 (4.7–5.2)	1.3 million (1.1 million–1.5 million)
Middle East and North Africa	460 000 (400 000–530 000)	75 000 (61 000–92 000)	0.2 (0.2–0.3)	24 000 (20 000–27 000)
South and South-East Asia	4.1 million (3.7 million–4.6 million)	270 000 (240 000–320 000)	0.3 (0.3–0.3)	260 000 (230 000–300 000)
East Asia	770 000 (560 000–1.0 million)	82 000 (48 000–140 000)	0.1 (0.1–0.1)	36 000 (25 000–50 000)
Central and South America	1.4 million (1.2 million–1.6 million)	92 000 (70 000–120 000)	0.5 (0.4–0.6)	58 000 (43 000–70 000)
Caribbean	240 000 (220 000–270 000)	17 000 (13 000–21 000)	1.0 (0.9–1.1)	12 000 (8500–15 000)
Eastern Europe and Central Asia	1.4 million (1.3 million–1.6 million)	130 000 (110 000–160 000)	0.8 (0.7–0.9)	76 000 (60 000–95 000)
Western and Central Europe	820 000 (720 000–910 000)	31 000 (23 000–40 000)	0.2 (0.2–0.2)	8500 (6800–19 000)
North America	1.5 million (1.2 million–2.0 million)	70 000 (44 000–130 000)	0.5 (0.4–0.7)	26 000 (22 000–44 000)
Oceania	57 000 (50 000–64 000)	4500 (3400–6000)	0.3 (0.2–0.3)	1400 (<1000–2400)
Total	33.3 million (31.4 million–35.3 million)	2.6 million (2.3 million–2.8 million)	0.8 (0.7–0.8)	1.8 million (1.6 million–2.1 million)

The ranges around the estimates in this table define the boundaries within which the actual numbers lie, based on the best available information.

Source: UNAIDS Report on the Global AIDS Epidemic 2010.

UK, Western Europe and USA

The number of people living with HIV in North America and Western and Central Europe has increased, with a 30% rise since 2001, and reached an estimated 2.3 million people in 2009. Heterosexual transmission represents about 50% of new HIV infections. In 2007, almost 17% of these new infections were among people from countries with generalized epidemics. The data are indicative of a resurgence of the HIV epidemic among men who have sex with men (MSM) in North America and Western Europe. Between 2000 and 2006 there was an 86% rise in the annual number of new HIV diagnoses in this risk group.

In the UK, the Health protection Agency (HPA) predicts that by 2012 the number of people living with HIV will continue to rise and reach 100 000. In 2009 there was an estimated 86 500 people thought to be living with HIV, 26% of these with undiagnosed infections. Among those with diagnosed HIV, 43% are MSM, 51% are heterosexuals and 2% are injecting drug users (Table 1.2).

In 2010, the largest number of new diagnoses of HIV in the UK was recorded among MSM (Figure 1.2). Most infections among heterosexuals were acquired abroad, the majority from sub-Saharan Africa. There is a downward trend in the numbers of infections acquired abroad, thought to be due in part to changes in immigration policies (Figure 1.3).

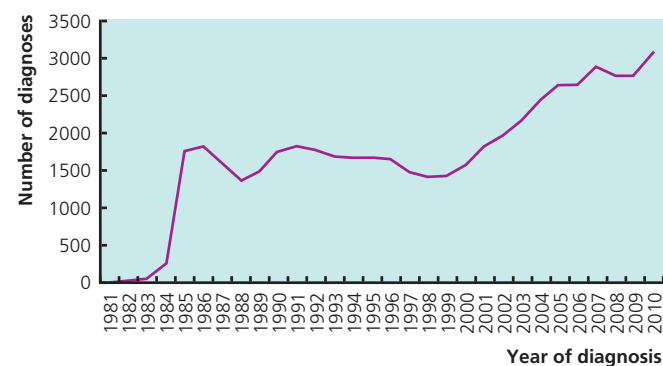
In the USA there were an estimated 1,099,161 people living with HIV by the end of 2009 (Table 1.2), 48% among MSM, 25% in injecting drug users and 18% in heterosexuals. HIV disproportionately affects racial and ethnic minorities, with 45% of newly infected people in 2006 arising from the African-American population.

Table 1.2 Cumulative reported cases of diagnosed HIV by exposure category in the USA and UK, 2009.

Exposure category	USA*	Proportion (%)	UK†	Proportion
Men who have sex with men (MSM)	529 908	48	28 090	43
Injecting drug use (IDU)	273 444	25	1550	2
MSM/IDU	77 213	7		
Heterosexual	198 820	18	33 310	51
Other	19 776	2	2369	4
Total	1 099 161	100	65 319	100

*Centre for Disease Control (CDC), USA.

†Health Protection Agency (HPA), UK.

**Figure 1.2** Annual New HIV diagnoses among men who have sex with men, UK, 1981–2010. Source: Health Protection Agency.