

## CHAPTER 22

# Impact of AIDS – the health care burden

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**AS THE LEADING CAUSE** of illness and death in sub-Saharan Africa, HIV and AIDS have become an added burden on already strained health care systems. The full extent is not yet apparent because of the latent period between infection and illness and death. Data on the effect of AIDS on health care systems are scarce, most studies being small and cross-sectional.

The main impact on adult health services appears to be increased hospital admissions, leading to ward overcrowding and possible exclusion of HIV-negative patients as a result. The increasing incidence of TB that accompanies HIV in southern Africa has also had an effect on hospital and other health care services. Increased mortality is seen in both patients infected with HIV and those who are not.

A disproportionate increase in the numbers of medical paediatric admissions against surgical admissions suggests that paediatric HIV is having an impact on paediatric health care services. Studies have found that HIV-positive children have more contact with health care services than those that are negative and mortality among those infected with HIV is consistently higher than among those who are not.

Treating intercurrent illness appears to be more costly among patients who are HIV positive than among those who are not infected. This was particularly the case for those co-infected with HIV and TB according to a study from Kenya.

It is unlikely that the public health sector is going to be able to sustain the increasing costs of treating HIV-positive patients, which means that some form of rationing is inevitable and is probably already happening.

It is likely that the marginal costs of HIV in the private health sector will not rise as much as this sector already spends more per patient than the public health sector. However, those private schemes

that cater for the lower end of the market may be faced with escalating costs as this is the population with the highest HIV prevalence.

AIDS is now the leading cause of morbidity and death in sub-Saharan Africa including South Africa and the epidemic has therefore become an added burden on already strained health care systems. It is estimated that in 2002 there were between 4.5 million and 6.5 million people living with HIV and AIDS in South Africa and of this, about 25% (1.1 to 1.6 million people) were likely to be symptomatic including 7% (315 000 to 455 000 people) with full-blown AIDS. Because HIV infection affects predominantly young adults, among whom health status is usually good, the epidemic is changing the pattern of disease and placing an increased demand on health care services.

However, the full extent of the impact has not yet been felt because of the length of the latency period between acquiring HIV infection and the development of HIV-related illnesses. The individuals with AIDS who are now seeking health care are predominantly those infected more than seven years ago when the antenatal prevalence of HIV was 10%, substantially below the 24.8% estimate for 2001. Indeed, it is estimated that the number of AIDS cases is likely to climb sharply to 500 000 by 2005 and to 800 000, or double the current numbers, by 2010.

There is a scarcity of data on the impact of HIV on health care services with most of it coming from small, cross-sectional studies. Even the longitudinal data tends to be focused on specific wards and with no large-scale studies published, there are few data on the impact on health services more broadly. Nevertheless, there are trends and patterns that emerge from what data are available.

This chapter describes the impact on health services resulting from an increasing disease burden and a shifting in the patterns of disease. It also discusses the rising prevalence of HIV among health workers and the negative impacts of this overwhelming epidemic on their functioning.

## Impact on adult health services

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During the late 1980s and early 1990s reports from eastern African cities described HIV prevalence rates of up to 80% among hospitalised patients and hospital bed occupancy rates approaching 200%. The pattern was similar in other parts of Africa stretching from Guinea Bissau to Zambia. In Nairobi, Kenya, bed occupancy in the Infectious Diseases Hospital rose from 69% to 81% from 1985 to 1990 with an increase of 61% in the number of registered TB cases and a significant rise in TB-related mortality.

The HIV epidemic was established in South Africa later than in eastern and central Africa, but by the early 1990s HIV was beginning to have an impact on health care services. A study conducted in the rural district of Hlabisa on the eastern seaboard of South Africa tracked the impact of the epidemic on the district hospital from 1991 until 1998. During this time there was no increase in hospital beds but total hospital admissions increased by 81%. The most dramatic rise in adult patient numbers was because of a 360% increase in ward admissions for tuberculosis whilst the HIV prevalence among TB patients went from 35% in 1993 to 68% by 1997. Mortality among TB patients in the same district rose by 46% from 1991 until 1995. Over the same period the HIV prevalence among pregnant women went from 4% to 29%. This rise in TB case load in tandem with a rising HIV prevalence has been reported elsewhere.

Most other South African studies have been conducted in larger, city-based hospitals and available data on the HIV prevalence among hospital patients are presented in TABLE 22.1. During 1998 the prevalence of HIV among medical inpatients in a tertiary hospital in Durban was 54% with 84% of these patients having AIDS according to the WHO expanded case definition of AIDS. In comparison to HIV-negative patients, HIV-positive patients were significantly younger, were 2.4 times as likely to die whilst hospitalised and were more likely to be transferred. Mean length of hospital stay was similar for the two groups.

At the 2003 Durban AIDS conference the Human Sciences Research Council (HSRC) released preliminary results of a study on the prevalence of HIV among health care workers and patients in four provinces. Within the public sector, the overall prevalence of HIV among a combination of all patients was 28% with the prevalence being 26% among clinic attendees and 46% among inpatients (TABLE 21.1). More women (31%) than men patients (22%) were HIV positive but this was not statistically significant.

Reference	Study setting	Year	No tested	% HIV+	% HIV+ with AIDS	Mortality HIV+	Mortality HIV-
HSRC 2002	Patients from health facilities in 4 provinces	2002	581	28%			
Colvin 2001	Adult medical wards, tertiary hospital, KZN	1997	507	54%	84%	22%	9%
Wilkinson 1999	Gynaecology wards, district hospital, KZN	1997	196	42%		1%	1%
Hassig 1990	Medical wards, public hospital, Kinshasa Zaire	1988	251	50%	50%	50%	30%

TABLE 22.1 Summary results from HIV prevalence studies among adult users of health services in southern and East Africa

Unfortunately, there are little additional non-anecdotal data on the impact on health services but impressions are that the services are under strain. In KZN, arguably the province with the highest HIV prevalence rate, medical beds at hospitals such as Northdale and Edendale in Pietermaritzburg and in several rural hospitals are running at 120% over capacity because of AIDS, according to a report in the *South African Medical Journal* in 2001. The superintendent at Hlabisa, a rural district hospital, claimed that for three years his medical wards have run at 140% occupancy. The shortage of beds means that during inclement weather and overnight, each bed is occupied by one or two patients and sometimes there is another patient on the floor underneath.

## Patterns of illness and disease

HIV/AIDS is also changing the way in which patients present and the pattern of diagnoses. In 1990, when the heterosexual HIV epidemic was beginning in South Africa, it was noted that the most common diseases presenting to the Baragwanath AIDS clinic in Soweto outside Johannesburg were tuberculosis followed by pneumonia, herpes zoster and 'slim' disease. Later in the 1990s a study was done on the distribution of presenting symptoms and initial diagnoses among HIV-infected and uninfected patients admitted to the adult medical wards of a large tertiary hospital in Durban (the results are given in TABLE 22.2). Another study conducted in an HIV clinic in a large Soweto hospital had similar findings with the most common presenting problems being lymphadenopathy, weight loss, TB and oral candidiasis.

Disease/clinical findings	% with disease among HIV infected (n=131)	% with disease among HIV uninfected (n=87)	RR of having disease if infected with HIV
Oral/oesophageal candidiasis	43% (56)	2% (2)	18.6 ( 4.7-74.2)
Generalised lymphadenopathy	49% (64)	7% (6)	7.1 (3.2-15.6)
Unexplained fever	48% (63)	7% (6)	7.0 (3.2-15.6)
Chronic diarrhoea	21% (28)	3% (3)	6.2 (1.9-19.8)
> 10% weight loss	41% (54)	9% (8)	.5 (2.2-8.9)
Pulmonary TB	56% (74)	7% (6)	3.1 (1.9-4.9)
Extra-pulmonary TB	6% (8)	0% (0)	not calculable

TABLE 22.2 Risk of selected symptoms, signs and diseases among HIV infected compared with HIV uninfected patients for medical ward patients in a large, tertiary hospital in Durban, South Africa

This synergy between HIV and TB is posing a significant threat to TB control in sub-Saharan Africa, which has the greatest TB burden in the world and is growing at an annual rate of 6% (see CHAPTER 29 for a more detailed discussion of the association between HIV and TB).

In summary, there is evidence that over the last ten years total hospital admissions have been rising and an increasing proportion are due to people with HIV-related disease. The pattern of admissions is also changing with the average age of patients decreasing and HIV-related diseases such as tuberculosis, pneumonia, diarrhoea and disseminated fungal infections becoming more common. The overall mortality of hospitalised patients is increasing but this is largely due to the higher mortality rates among the HIV infected. The impact on HIV-negative patients is not clear although there must be some 'squeezing out' of these patients. The potential negative impacts on those uninfected with HIV, such as rising mortality or decreasing hospital stays, has not been demonstrated in South Africa, although it has been shown in some other African countries.

### Impact on paediatric health care services

The prevalence of HIV among children in Africa and the morbidity and mortality rates among these children is likely to be more severe than experience from the industrialised countries may indicate. The reasons for this are listed in TABLE 22.3.

**TABLE 22.3** Likely reasons for higher rates of morbidity and mortality in children born to HIV-positive mothers in Africa compared with experience in the industrialised countries

- *Higher rates of mother – to – child transmission*
- *Increased and variable risk of infection from the environment*
- *Poor nutrition*
- *Limited access to standard and specialist medical and social care*
- *Ill-health in the mother and other potential carers*
- *Stigmatisation of infants with real or presumed infection*

For South Africa, Dorrington and colleagues, using the ASSA model, predicted a total of just under 1.2 million births for the year 2002 with an estimated 89 000 (6.7%) children being HIV infected at birth and through breast feeding. In the absence of a national antiretroviral programme, it is expected that 50% of these children will die of AIDS-related disease within three years and 90% by nine years. Prior to death these children will be accessing health services for their pre-morbid illnesses.

Turning from modelled to measured data, TABLE 22.4 shows the results of studies in southern and eastern Africa that have estimated the proportion of HIV-positive children using health services.

Estimates vary from 8% to 63% of paediatric patients with the proportion who are HIV positive decreasing with age. The only longitudinal data published was a report from a rural district hospital in KZN that indicated that there was a 68% increase in medical paediatric

admissions between 1991 to 1996 with only an 18% increase in surgical admissions. The disproportionate increase in medical patients was attributed to an increase in HIV-related medical illnesses. As with the adult studies, most of the published studies are cross-sectional and focus on specific hospital wards, which makes it difficult to assess the overall impact. Nevertheless, there are some consistent findings across the published literature.

Importantly, the mortality of HIV-positive children is consistently and substantially higher than among the HIV-negative.

Most studies found that length of hospital stay was not different between HIV-positive and negative children. However, one study in

Ref	Study setting	Year	No tested	% HIV+	Mortality HIV+	Mortality HIV-
Pillay 2001	Paediatric wards, tertiary hospital, KZN	1997	160	63%	20%	12%
Meyers 2000	Paediatric wards, tertiary hospital, Gau	1996	507	29%	17%	5%
Johnson 2000	Paediatric wards, tertiary hospital, Gau	1998	176	18%	NA	NA
Yeung 2000	Paediatric wards, rural hospital, KZN	1996/7	281	26%	21%	7%
Roux 2000	Paediatric wards, 18 hospitals in Cape Town	1999	1264	8.3%	NA	NA
Kawo 2000	Paediatric wards, Dar es Salaam	1995/6	2015	19.2%	21.4%	8.4%

**TABLE 22.4** Summary results from HIV-prevalence studies among paediatric users of health services in southern and East Africa

Soweto found that HIV-positive children stayed in for an average of eight days compared with an average of six days among the HIV-negative children. This lack of difference in hospital stay may be partly due to the fact that HIV-positive children have a higher mortality and higher referral rate. To clarify this point future studies should report the length of stay for only those who are discharged.

Most studies have also found evidence that HIV-positive paediatric patients have previously had more contact with the health care system than HIV-negative children. In the Durban study, HIV-positive patients were 2.7-times as likely to have been previously admitted and 2.3-times as likely to have had an outpatient consultation, whilst a study in a rural KZN district also reported that HIV-positive children were more likely to have been previously admitted. In a Soweto study 48% of HIV-positive children had previously been admitted compared with 20% of HIV-negative children.

The prevalence of HIV and HIV-related disease is increasing among paediatric patients using public sector health services. Whilst the spectrum of disease is not substantially different between the HIV – positive and HIV – negative cases, certain diseases such as pneumonia, diarrhoea, fungal infections and malnutrition are more common among the HIV positive and tend to have a higher mortality rate. HIV-

positive children do respond to standard treatment protocols but clinicians need to be ready to change therapy should response be poor.

The increasing burden on health care facilities may have a negative impact on the care of the HIV-negative children and alternative care strategies, such as more rational use of clinics and home-based care, need to be developed. The impact of HIV among children could be substantially reduced if there was an effective, national mother-to-child transmission (MTCT) prevention programme and universal access to antiretrovirals.

### Impact of HIV on other paediatric infectious diseases

From the beginning of the epidemic, there have been concerns that the immunosuppressive effect of HIV infection may affect the natural history or epidemiology of other infectious diseases including the vaccine preventable illnesses and traditional tropical diseases. HIV infection may make children more susceptible to other infections or make the infections more severe and could conceivably cause the population's herd immunity to fall making it susceptible to new epidemics. Although the number of clinical studies is limited there is evidence that HIV-infected children suffer a similar clinical spectrum but with more severe and recurrent forms of a number of infections, including bacterial infections, pneumonia, septicaemia, diarrhoeal diseases and measles.

In local studies of children attending health care facilities, infectious diseases were the most common reasons for admission, regardless of HIV status. However, certain diseases, including pneumonia and gastroenteritis, tended to occur more commonly among the HIV-positive patients. In a Soweto study, pneumonia and gastroenteritis occurred 1.7-times and 1.4-times as frequently among the HIV positive and in a study in Durban, HIV-positive children were three times as likely to have a diagnosis of pneumonia and 18 times as likely to have a diagnosis of oral candidiasis. A number of researchers have also found that malnutrition is significantly more prevalent among the HIV positive.

Whilst common pathogens are believed to be responsible for the bulk of cases of pneumonia and diarrhoea among children in sub-Saharan Africa, the significance of opportunistic infections such as *Pneumocystis carinii* pneumonia (PCP) and cytomegalovirus have been overlooked, mainly because of the lack of diagnostic facilities. In a study in Johannesburg among two- to 24-month-old HIV-infected children hospitalised with severe pneumonia, PCP was found in just under half of the 105 children and cytomegalovirus pneumonia was diagnosed histologically in 44% of 18 postmortem cases. In another

local study, PCP was the AIDS-defining event in 20% of hospitalised children and was associated with a significantly higher mortality.

Several researchers have reported that HIV-positive children respond well to antibiotic therapy, but at least one local study found that a satisfactory response to initial antibiotic therapy was less frequent in the HIV positive (56%) than in the HIV negative (73%).

## Health service utilisation and costs

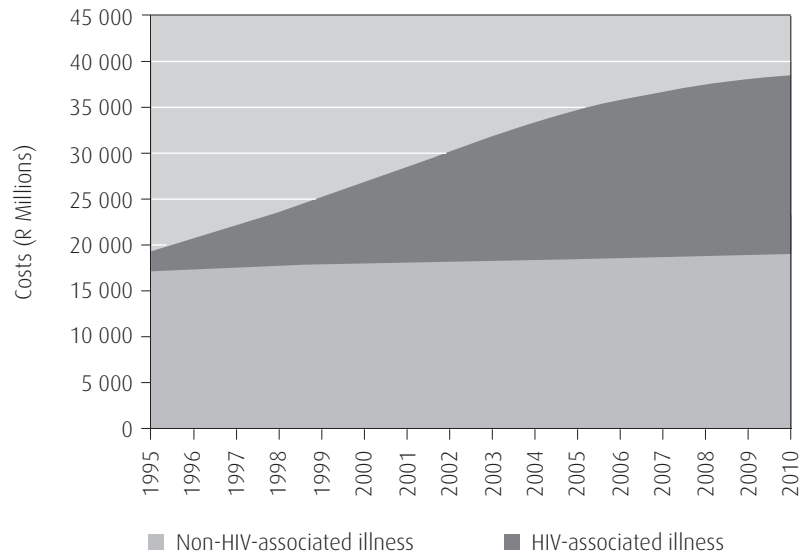
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Once the natural history of HIV infection became apparent in the mid 1980s, it was anticipated that this would be an expensive disease to manage and would substantially increase the burden on the health care system. International studies bore this out and found that health service utilisation and resulting costs increased with the severity of illness and were particularly high in the three months before death.

A few studies in Africa have attempted to determine the resource utilisation or cost of managing HIV-positive patients in comparison to HIV-negative patients. A study in Nairobi, Kenya found that treating TB in HIV-positive patients was, on average, 25% more costly than treating HIV-negative patients, mainly because of the costs of drugs for treating intercurrent infections in the former group. However, a study conducted in Kinshasa, Zaire (now Democratic Republic of the Congo) found that hospitalisation costs did not differ between HIV-positive and HIV-negative inpatients.

The escalating burden on the public health care system described above will require an increasing level of resources to care for individuals with AIDS. Whilst the costs of managing the HIV/AIDS epidemic are not routinely measured, ABT and Associates have used demographic projection models and data on currently observed HIV-associated health care costs to make ten-year forecasts. The model used assumed that levels of care offered in the mid-1990s and the associated costs would continue to be made available over the next ten years despite increasing levels of illness. The costs and potential cost savings of providing antiretroviral therapy were also not considered. FIGURE 22.1 shows the estimated costs until 2010 in constant 2000 terms for acute in- and outpatient care but excludes long stay, rehabilitation activities and administration and managerial costs. The figure shows that acute health care costs are likely to double in real terms in the public sector if current levels of care are maintained.





**FIGURE 22.1** Cost of public sector health care by year – constant 2000 rands

### Impacts of increased case load burden and escalating public sector health care costs

The estimated resources required to maintain current levels of health care, particularly for inpatients, are unlikely to be sustainable which means that some form of rationing will have to be implemented. While data demonstrating rationing are scarce, a few studies in East and southern Africa have found that a decreasing proportion of patients are HIV negative and that among these patients the absolute and relative mortality rates have increased. The rise in mortality of non-HIV-infected patients, which has increased in tandem with the overcrowding of hospitals, has been cited as evidence of declining health care standards. An increase in mortality from 13.9% to 23% among HIV-negative patients in a Nairobi hospital over a four year period was attributed to increasingly stringent hospital admission requirements and that this was favouring HIV-positive patients at the expense of HIV-negative patients.

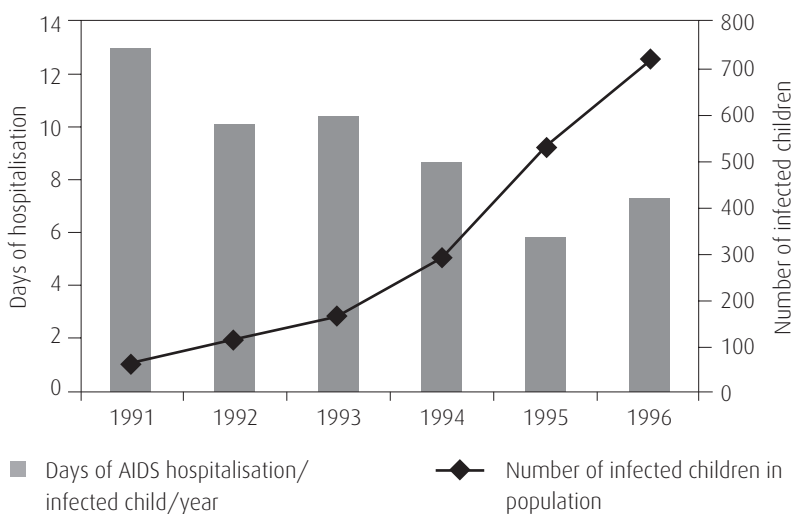
There is now some evidence that rationing of health care may already be occurring in South Africa as demonstrated by **FIGURE 22.2** which shows that HIV-infected children are staying in hospital for increasingly shorter periods.

In the rural district hospital of Hlabisa, the superintendent was reported as claiming that, 'Blood pressure readings and medications are missed, or are wrongly dispensed by inexperienced nurse-aides and that many diabetics and hypertensives, disenchanted with the levels of care, no longer bother to come in.' Dr Kimesh Naidoo of

Grey's Hospital says that at regional hospitals community service doctors are making life or death decisions simply because of the lack of consultants. 'They have to decide how far they must go, when to drop IV or antibiotics, should they ventilate this child? If the kids are HIV positive we don't ventilate and the kids die - that's become general practice'.

One strategy for reducing the impact of HIV/AIDS on the health services is to make more rational use of primary health care facilities and appropriate referral policies. Even before the HIV/AIDS epidemic it was clear that many patients were being treated in referral and specialist facilities when this was not necessary. In 1990 a study reported that 42.2% of attendees at a tertiary level hospital in Durban, KZN could have been medically managed in a primary care facility. A later study which considered only HIV-positive patients attending the HIV clinic of a teaching hospital found that 69.3% of all consultations were deemed suitable for treatment at the primary-care level. However, it was noted that as the severity of the disease increases (ie people move from WHO stage 1 to 3) there is a decrease in the proportion of patients that may be treated at this level.

Whether or not there has been a shift towards more rational use of health facilities or not is not clear but this strategy does need to be revisited.



**FIGURE 22.2** Rationing of access to hospital care for children ill with AIDS with increasing levels of infection

### Impact on the private health care sector

Approximately seven million people (15% of the population) in South Africa are not dependent on public health services but instead have access to private health care through membership of a medical

insurance scheme. Membership of these schemes is usually linked to employment and so it is the relatively wealthier sectors of society that have access to private health care.

In the 1980s, the insurance and medical aid industries responded to the anticipated impact of the AIDS epidemic by attempting to contain the risk. They implemented an almost total, if ineffective, exclusion of HIV benefits. Annual benefits for HIV-related disease of R100 were the norm. Health care providers reacted by not disclosing the HIV status of patients whilst providing treatment for legitimately reimbursable illnesses such as pneumonia and chronic diarrhoea.

The largely futile response of the medical aid industry and objections to the discriminatory nature of their rules led to the implementation of the Medical Schemes Act in 1988, which banned previously widespread practices against people living with HIV/AIDS such as risk rating and excluding infected individuals from membership.

Another important development in HIV care within the private health sector has been the rise of managed care programmes. The primary aim of managed care is to contain costs and it has achieved mixed success. However, managed care has been more successful in the area of HIV/AIDS care because it is based on the premise that the major cost driver in managing HIV-related disease is hospitalisation and that antiretrovirals, although costly, are effective in reducing morbidity and improving survival. Managed care has also been able to address the underlying problems posed by the high cost of drugs, low benefits and the lack of expertise by most doctors in managing HIV/AIDS.

The largest managed care programme is AID *for* AIDS (AfA) which has 39 medical schemes contracted to it, covers two million beneficiaries, has 20 000 HIV-infected people registered and provides antiretroviral treatment to 12 000 persons. AfA claims to be a comprehensive and confidential disease programme that manages access to antiretrovirals and related drugs and disease monitoring, combined with a doctor and patient telephonic support system. AfA has also published data to support their claim to have reduced MTCT to 5.3%, improved virological and CD4 responses and stabilised hospitalisation costs. However, there are still no data published on the overall cost effectiveness of this programme.

Although there are few data on the prevalence of HIV among medical aid scheme members or on the impact of the epidemic on the schemes, it is likely that the private sector will be less affected than the public sector. This is in part because HIV prevalence is lower among medical aid scheme members because a higher proportion are of a higher socioeconomic status. Another reason is that the private sector already spends more than four times as much as the

public sector per person covered and so the marginal impact of HIV/AIDS on overall costs will be relatively less. Nevertheless, there is some evidence that the schemes that cater for the lower end of the market, where there is a higher prevalence of HIV, are being threatened with runaway costs.

In spite of the changes in the legislation referred to above, businesses and industries in the private sector have more flexibility and scope to avoid the economic burden of AIDS than the government and there is evidence that the burden is being systematically transferred away from the private sector and private health care. Practices that shift the burden to households and government include reductions in employee benefits, restructured employment contracts, outsourcing of low-skilled jobs and selective retrenchments. Many firms have replaced defined-benefit retirement funds with defined-contribution funds, which eliminate risks to the firm but provide little for families of younger workers who become incapacitated or die of AIDS. Responsibility for the health care of these individuals and families falls back onto the households, NGOs and government. The widespread practice of contracting out previously permanent jobs also serves to protect companies from benefit and turnover costs. Whilst many of these changes are primarily responses to globalisation, they are potentially devastating for the households of employees with HIV/AIDS.

## HIV/AIDS and health care workers

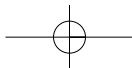
In addition to the risk of infection through the same routes as the general community, health care workers are at added risk through their exposure to HIV-contaminated blood and body fluids in the workplace. Risk of HIV infection is higher in Africa than elsewhere in the world because of the high prevalence of these diseases in the general population and because health care workers frequently lack the training and equipment to adequately protect themselves. A study conducted at Chris Hani Baragwanath hospital near Johannesburg found that 69% of interns reported one or more percutaneous exposures to blood during the intern year and 56% had suffered a penetrating injury during pre-clinical training and 18% recollected needlestick injuries involving HIV-positive patients. At Tygerberg Children's Hospital near Cape Town, it was recently reported that 91% of young doctors had suffered needlestick injuries and 55% had been exposed to HIV.

However, in spite of these occupational hazards, evidence suggests that the distribution of HIV and exposure to risk factors among health care workers are little different from the general community.

In the Human Sciences Research Council (HSRC) study of HIV in the health sector in four provinces, the HIV prevalence among public sector health care workers was 16%, which is lower than the Dorrington/Bradshaw estimate of 23.4% among 18 to 64 year olds but very similar to the Nelson Mandela/HSRC estimate of 15.6% among 15 to 49 year-old adults. A study in Zaire found that health care workers had a similar HIV seroprevalence to the general community and that neither injections nor the intensity of nosocomial exposure was related to risk of HIV infection. Several other studies in Africa conducted on indigenous health care workers and on expatriate medical workers point to similar conclusions, ie that the overwhelming majority of HIV infections among health workers are due to sexual exposure.

While the physical risks of acquiring HIV from workplace exposures may be small, the HIV/AIDS epidemic has had other, more subtle impacts on health care workers. The perceived threat posed by exposure to HIV-infected blood, body fluids and patients is a source of mental stress. A recent study in Kenya reported that the fear of contamination by HIV was having a negative effect on the motivation and aspirations to practise medicine for over 50% of young doctors interviewed. Even more of the doctors, 82%, stated that the overwhelming HIV/AIDS epidemic was having the same negative impacts. The study concludes that, among other reasons, the high number of AIDS patients has significantly affected the doctors' perceptions of themselves, their technical proficiency, their ability to care and feel for others and themselves and, for some, their entire sense of self. A 'roll on' negative effect on patients was also reported.

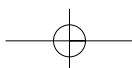
Nearer to home, in 2001 Dr Jim Muller, the Acting Head of Medicine for Edendale, Grey's and Northdale Hospitals, stated bluntly, 'People are dying prematurely because we are so stretched. Medical patients who don't have HIV/AIDS are being severely compromised because we have to discharge them prematurely – everybody is being compromised – the system just can't cope'.



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