

THE STRATEGIC ROLE OF WATER IN ALLEVIATING THE HUMAN TRAGEDY ASSOCIATED WITH HIV/AIDS IN AFRICA

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ABSTRACT

The continuing HIV/AIDS pandemic is not simply a health issue that calls for commitment from governments to provide assistance in the form of anti-retroviral treatment to infected individuals. Instead, it is a development problem that affects the whole fabric, structure and future of many African societies and there is a high and growing probability that massive political, ecological and social changes will occur during the next few years. Efforts directed at minimizing the destructive social crises and maximizing the potentially constructive outcomes of the pandemic have recognized the indispensable role that the provision of wholesome supplies of water and appropriate sanitation services have in strengthening the ability of communities to withstand the impacts of increased AIDS-related mortality, and helping to ensure a longer life for people living with HIV/AIDS.

INTRODUCTION

The continuing HIV/AIDS pandemic across Sub-Saharan Africa has had an enormous impact on societies and the number of people dying from Aids-related diseases has reached truly alarming levels in several countries. The series of adverse impacts appears likely to continue – especially in southern Africa – where HIV prevalence rates have reached heights seen nowhere else in the world, and little evidence is available to suggest that national prevalence rates have declined in real terms (Van Dyk, 2001; Walker, Reid and Cornell; 2004; Marais, 2005: 8; UNAIDS, 2006a). The situation has been worsened in recent months by the emergence of a drug-resistant strain of tuberculosis, one of the opportunistic diseases of HIV/AIDS, which has now placed an increased health burden on people in southern Africa.

The HIV/AIDS pandemic threatens the future of African societies while the accompanying disintegration of social systems contributes to a social and ideological environment that favours the spread of the HIV virus. The most vulnerable victims of HIV/AIDS comprise the potentially most economically productive age group of the population, many of whom are living in extreme poverty (Whiteside and Sunter, 2000: 36; Ramasar and Erskine, 2002: 22; Kamminga and Schuringa, 2005: 2; Marais, 2005: 7-8).

Importantly, the HIV/AIDS pandemic is not simply a health issue that calls for commitment from governments to provide assistance in the form of anti-retroviral treatment to infected individuals. Instead, it is now widely acknowledged that HIV/AIDS is a development problem that affects the whole fabric, structure and future of African societies (Ashton and Ramasar, 2002; Barnett and Whiteside, 2002; Ramasar and Erskine, 2002; Whiteside & Sunter, 2002; Kamminga and Schuringa, 2005: 2), and there is a high and growing probability that massive political, ecological and social changes will occur during the next few years (Friedman *et al.*, 2006: 959). Efforts directed at minimizing the destructive social crises and maximizing the potentially constructive outcomes of the pandemic have recognized the indispensable role that the provision of wholesome supplies of water and appropriate sanitation services have in strengthening the ability of communities to withstand the impacts of increased AIDS-related mortality, and helping to ensure a longer life for people living with HIV/AIDS (Ashton and Ramasar, 2002; Van Wijk, 2003; Kamminga and Schuringa, 2005: 11; UN-HABITAT, 2006).

In order to more clearly understand the intricate linkages between HIV/AIDS and water, this chapter reviews the demographic impacts of HIV/AIDS in Africa, examines the socio-economic impacts of the disease related to water; and evaluates the strategic role of water to provide hope for those that are infected by HIV/AIDS.

IMPACTS OF THE HIV/AIDS PANDEMIC

Demographic Impacts

From the data in **Table 1** it is evident that the HIV epidemic is worsening at an alarming pace. According to statistics it is estimated that the number of adults and children in Sub-Saharan Africa living with HIV has since 2004 increased by 1.1 million and that the number of adults and children newly infected with HIV has increased by 0.2 million. Statistics also reveal that the annual number of deaths due to AIDS between 1997 and 2004 was 0.2 million. Similarly, statistics for North Africa and the Middle East show an increase. Between 2004 and 2006, adults and children living with HIV have increased from 400 000 to 460 000, adults and children newly infected with HIV have increased from 59 000 to 68 000, while adult and children deaths due to AIDS have increased from 33 000 to 36 000 (UNAIDS, 2006a, b).

Table 1: HIV/AIDS statistics and features as at end of 2006 (Source: UNAIDS 2006a).

Region	Year	Adults and children living with HIV	Adults and children newly infected with HIV	Adult prevalence %	Adult and child deaths due to AIDS
Sub-Saharan Africa	2006	24.7 million	2.8 million	5.9%	2.1 million
	2004	23.6 million	2.6 million	6.0%	1.9 million
North Africa and Middle East	2006	460 000	68 000	0.2%	36 000
	2004	400 000	59 000	0.2%	33 000

"Of what use are statistics if we do not know what to make of them?" was the question asked by Florence Nightingale during the Crimean War (Marais, 2005: 25). Today, more than 150 years later, the same question can justifiably be asked about the accumulation of HIV/AIDS statistics. Since the start of the HIV/AIDS pandemic in the early 1980s, the health of African populations has become increasingly adversely affected. This is particularly visible in increased rates of sickness and death at ages where normal rates of morbidity and mortality are low, mainly within the economically active and productive age groups of a population (Hooper, 2000; Janse van Rensburg, 2000; Whiteside and Sunter, 2000; Ashton and Ramasar, 2002: 218; Barnett and Whiteside, 2002). Initially, very little effort was directed towards utilizing these data to fully understand the scale, trends and trajectories of the HIV/AIDS pandemic. Many of the earlier warnings were ignored, disputed or dismissed (Ashton and Ramasar, 2002: 219; Marais, 2005: 25) and a lack of decisive and concerted action enabled the pandemic to exert devastating impacts on the social and economic fabric of most countries in Sub-Saharan Africa.

In those cases where epidemiological statistics did receive attention, epidemiologists often used predictive models that were derived from other disease epidemics to predict the spread of HIV/AIDS. These early models were adapted to fit the reported patterns of HIV/AIDS cases and it was concluded that the numbers of new HIV/AIDS cases would soon decline rapidly. When this did not happen, it was realized that curve fitting models did not work as well for HIV/AIDS because the transmission dynamics of HIV are much more complex than other diseases. Moreover, HIV/AIDS has a distinctive ability to continue moving from one group to another within a geographic region as a result of population dispersal and the heterogeneous contact patterns that spread infection (Whiteside and Sunter, 2000). No-one predicted that the pandemic would worsen at such an alarming rate (Ashton and Ramasar, 2002: 217; Barnett and Whiteside, 2002; Ramasar & Erskine, 2002: 24) sometimes

increasing by as much as tenfold in five years as has been recorded in several southern African countries (Sufian, 2000). Today, more than twenty years since the start of the pandemic, the collection of reliable data is still compromised in many African countries by political reasons, poor governance systems, fear and stigmatisation, under-reporting, a lack of health facilities, and the difficulty of collecting accurate data in remote rural areas where many people live. Consequently, organisations such as UNAIDS have to generate estimates that are based on relatively low levels of data, many of which are still unreliable, which in turn affects the accuracy of population projections. In addition, social epidemiologic analyses of the HIV/AIDS pandemic have also been neglected and very little attention has been paid to the role of social change and its potential importance in prevention efforts (Campbell, 2003; Myer *et al.*, 2004). In effect, therefore, the pandemic has been 'allowed' silently to take its toll, not only in terms of the high morbidity and mortality rates, but also in terms of the enormous non-linear impacts that affect every single aspect of society (**Text Box 1**).

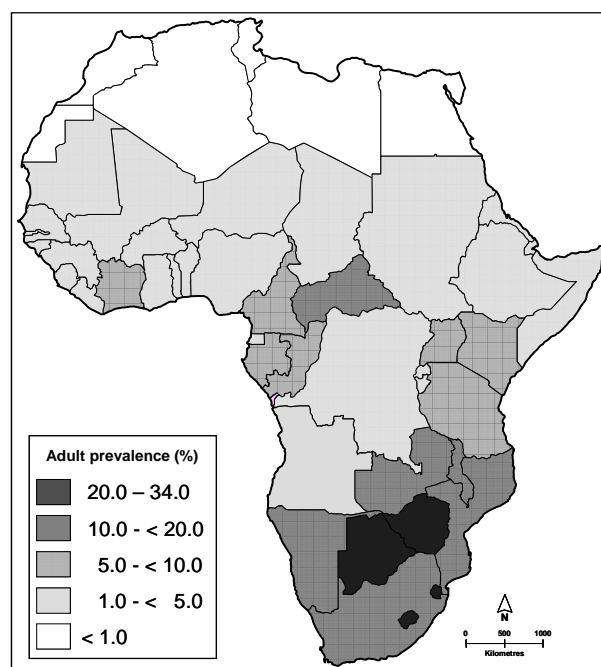
Text Box 1: Influence on statistics.

Stigmatization and discrimination influence statistics

The social stigma and discrimination related to HIV-positive victims remains an enormous barrier to the fight against AIDS. Fear of discrimination often prevents people from being tested, seeking treatment and publicly admitting their HIV status. The fear and prejudice that lies at the core of the HIV/AIDS discrimination needs to be tackled at both community and national levels.
(Source: <http://www.avert.org/aidssouthafrica.htm>)

The HIV/AIDS pandemic is a global problem and is not limited to the developing world. However, the overwhelming majority of HIV-positive people, some 95 percent of the global total, live in the developing world, where poverty, inadequate health and education systems, gender inequality and limited resources contribute to worsening the adverse impacts of the virus (Whiteside and Sunter, 2000: 37, 44; UNAIDS, 2006a). The burden of communicable diseases such as AIDS, tuberculosis and malaria is much greater in the poorer parts of the world where the lower life expectancy of people is a partial reflection of their exposure to infectious diseases (Barnett and Whiteside, 2002: 67). The demographic impact of HIV/AIDS in Africa needs to be evaluated (**Figure 1**) against the background of the global situation to fully appreciate the devastating situation, especially in sub-Saharan Africa.

Figure 1: Adult HIV prevalence (%) in Africa, 2005 (Redrawn from UNAIDS, 2006a).



The global situation

A global view of HIV/AIDS prevalence statistics reveals that approximately 38.6 million people were living with HIV in 2005 (UNAIDS, 2006a). The number of people living with HIV continues to grow and an estimated 4.3 million adults and children were newly infected with HIV in 2005; this figure is about 400,000 more than the estimate of newly infected individuals for 2004. Globally, new HIV infections are mostly concentrated among young people between the ages of 15 and 24, and overall, young people accounted for 40% of all new HIV infections in 2006 (UNAIDS, 2006a).

Sub-Saharan Africa

In Sub-Saharan Africa, adult prevalence rates are growing and recent estimates indicate that almost 25 million people are living with HIV/AIDS (UNAIDS, 2006a); this figure represents 63% of the global total. According to current statistics, more than 15 million Africans have died from AIDS and AIDS-related diseases since the beginning of the pandemic. It is estimated that two million Africans have died from AIDS and AIDS-related diseases during 2006 (UNAIDS, 2006a). This figure represents almost three quarters (72%) of all AIDS-related deaths globally. During 2005, an estimated 2 million adults and children died as a result of AIDS in Sub-Saharan Africa (Fredricksson and Kanabus, 2006; UNAIDS, 2006a, b).

Text Box 2: An increase in the 'death business'.

The number of AIDS deaths result in a sharp increase of the 'death business'

The number of AIDS-related deaths in Africa resulted in a sharp increase of the death business, which includes funeral services and coffin makers (Source: <http://www.caj.ca>). In Zambia, an area on the western fringes of the central business district in the capital, Lusaka, has been dubbed 'Death Valley' in recognition of the concentration of businesses like undertakers, coffin manufacturers and funeral insurance companies. Although the capital has six registered funeral parlours, a further 21 unregistered parlours have sprung up as a result of the growing demand for funeral services (Source: <http://www.plusnews.org>).

Southern Africa continues to bear the brunt of the HIV/AIDS pandemic as the prevalence rates continue to rise. In 2005, Swaziland had the highest adult HIV prevalence rate in the world at 33.4% (UNAIDS, 2006a: 19). South Africa also falls into the category of "high HIV prevalence countries" (Chetty and Michel, 2005; Phaswana-Mafuya and Peltzer, 2005: 277; UNAIDS, 2006a), with some 5.5 million people, including 240,000 children younger than 15 years of age, were living with HIV in 2005 (UNAIDS, 2006a). The latest official mortality data indicate that the total number of deaths from all causes in South Africa increased by 79% from 1997 to 2004, suggesting that South Africa has now reached the stage where increasing numbers of people are dying of AIDS-related diseases (Dorrington *et al.*, 2001; South African Medical Research Council, 2005; UNAIDS, 2006a). The increasing death toll has driven average life expectancy below 50 years in three of South Africa's provinces, namely Eastern Cape, Free State and KwaZulu-Natal (Dorrington *et al.*, 2006).

HIV data gathered at South African antenatal clinics continue to show a rising trend in HIV infection levels among pregnant women (UNAIDS, 2006a). As in the rest of Sub-Saharan Africa, the epidemic in South Africa continues to have a disproportionately greater effect on women, with young women between the ages of 15 and 24 years being four times more likely to be HIV-infected than are young men of a similar age (UNAIDS, 2006a). According to the 2005 national HIV household survey in South Africa, one in three women aged between 30 and 34 were living with HIV in 2005, as were one in four men aged between 30 and 39. In addition, high HIV infection levels were also found among men older than 50 years, more than 10% of whom tested HIV positive. In Namibia, the adult national HIV

prevalence was estimated at 19.6% in 2005 while the national adult HIV infection levels for Botswana and Lesotho are also high at between 20–24% (UNAIDS, 2006a: 19-20).

Text Box 3: Rape and the high prevalence of HIV and social disruption

Rape plays a significant role in the high prevalence of HIV and social disruption

Many black South African men infected with AIDS erroneously believe that, by having sex with a virgin, even a child or baby, they will be cured of AIDS or their HIV infection. This misconception is fuelling what is already one of the highest child sexual exploitation rates in the world. According to crime statistics for the year 2000, the latest report by South Africa's Police Service, children are the victims of 41 percent of all rapes and attempted rapes reported in the country. Over 15 percent of all reported rapes are against children under 11, and another 26 percent against children 12-17. The trend is worsening. Babies as young as only a few months old are being raped almost daily (Source: <http://www.worldnetdaily.com>). In a 2006 study of 1,370 South African men, nearly one fifth of them revealed that they had raped a woman. (Source: <http://www.avert.org/aidssouthafrica>)

In East Africa, the general trend of a stabilizing or a declining HIV prevalence appears to be continuing and HIV infection levels happen to be lower in this region than in the south of the continent. National HIV prevalence among pregnant women has declined in Kenya and Tanzania and, to a slightly lesser extent, in Rwanda. Programs to prevent the spreading of HIV/AIDS in Uganda have initially succeeded in lowering its high infection rates. However, the latest research results indicate a possible erosion of the gains that Uganda made against AIDS in the 1990s, while HIV infection levels among pregnant women in Burundi's capital, Bujumbura have also shown a sudden increase in 2005 (UNAIDS, 2006a).

In Central Africa, adult HIV/AIDS prevalence data indicate that Cameroon (5%) and the Central African Republic (11%) are most heavily affected (UNAIDS, 2006a). In Cameroon, infection levels are highest in the north-west and eastern regions (almost 9%) and lowest in the north of the country (2% or lower) (UNAIDS, 2006a). As indicated elsewhere, these numbers are regarded as underestimates because they are based on limited surveillance data and estimates derived from discussions with local governments, where many politicians are reluctant to allocate domestic resources to HIV/AIDS programmes.

In West Africa, the urban parts of Burkina Faso, Côte d'Ivoire and Ghana are showing signs of declining HIV prevalence, while adult HIV prevalence appears to be increasing in Mali (UNAIDS, 2006a: 5-6).

Africa North of the Sahara

In the mainly Muslim countries of North Africa, inadequate HIV surveillance has had a distinctly adverse effect on the accuracy and quality of the HIV/AIDS data that are available. As a result, the HIV prevalence data for these countries seems very low when compared to those of southern African countries. Despite the tragedy that is unfolding in southern Africa, only a few Islamic authorities north of the Sahara seem to have responded to the alarm (Sufian, 2000; Eberstadt and Kelly, 2005; Kuppusamy, 2005) and few leaders have realized that Islamic culture and beliefs do not make a population immune to HIV/AIDS. Until recently, many Islamic authorities regarded HIV as a "disease of the West", and considered that the region was unlikely to be subjected to the spread of the virus because Islamic rules require no sex outside of marriage (Williams, 2005). After years of neglect and denial, there are recent signs in some of the North African countries of a dawning awareness that HIV/AIDS is becoming a domestic dilemma. It is not yet clear what impact this will have as awareness means acceptance as the "respectable" face of AIDS in North Africa. The only people that are willing to discuss the disease are men who have contracted HIV through blood transfusions, or women who have been infected by their husbands. Only a few are willing to talk openly about commercial sex as it

is illegal in much of the region. Denial, stigma and discrimination are still enormous problems, not least among the region's medical professionals (El Feki, 2006: 975-976). The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates the total HIV-positive population of North Africa, the Middle East, and predominantly Muslim Asia at nearly one million people (Eberstadt and Kelly, 2005).

UNAIDS data on the number of people living with HIV/AIDS are completely missing for a number of African countries. The lack of adequate data and the deliberate avoidance of HIV/AIDS discussions are hampering appropriate responses to the very real probability that HIV/AIDS transmission rates will increase dramatically once a certain threshold has been reached (Sufian, 2000; Kuppusamy, 2005). According to Joan MacNeil, Senior HIV/AIDS Specialist for the Global HIV/AIDS Program of The World Bank Group, an epidemic threshold is reached "when enough critical mass of risk behaviours and contributing biological factors exists in a population to sustain an epidemic" (Sufian, 2000; Kuppusamy, 2005). This means that an epidemic will be sustained and grow if an infected individual infects more than one additional person in their lifetime. Importantly, however, the threshold can be dramatically influenced by the size of risk populations, the type and frequency of risk behaviour, and the presence of other sexually transmitted infections (Kuppusamy, 2005). If governments delay action, the trend witnessed in other regions of Africa will likely recur in North Africa (Sufian, 2000; Kuppusamy, 2005).

Text Box 4: Effect on HIV/AIDS governance.

Denial affects HIV/AIDS governance

Many people argue that the response to HIV/AIDS in South Africa has been hampered by 'AIDS denialism', a minority scientific movement that refutes the orthodox idea that HIV causes AIDS. Some leading figures in South Africa have flirted with this school of thought, much to the dismay of AIDS activists. President Mbeki has consistently refused to acknowledge that HIV is the cause of AIDS; he argues that HIV is just one factor among many that might contribute to deaths resulting from immunodeficiency, alongside others such as poverty and poor nutrition.

(Source: <http://www.avert.org/aidssouthafrica.htm>)

Socio-economic impacts of the HIV/AIDS pandemic related to water

Against the background of the demographic data on HIV/AIDS, it is important to examine the close link between these statistics and the impacts that flow from it. A clear understanding of the relationship between the HIV/AIDS demographic characteristics (such as population numbers, growth rates, structures of populations, structure by gender and age, key indicators such as birth, death and fertility rates, life expectancy and infant and child mortality, health status and health needs) is essential for determining the amount of health care and infrastructure resources required by the population (Gilbert *at al.*, 1997: 97; Barnett and Whiteside, 2002: 167), and for determining the likely mitigatory actions required to alleviate the negative impacts on all other spheres of life.

The unusual levels of morbidity and mortality caused by HIV/AIDS exert continuous changes on population dynamics. Therefore, ongoing studies of human groups with reference to their size, composition and distribution are needed if we are to fully understand, cope with and mitigate these negative effects. Past oversimplification of HIV/AIDS demographic statistics has contributed to widespread ignorance about the devastating socio-economic impacts that the pandemic would have on societies in Sub-Saharan Africa. In many cases, HIV/AIDS was considered to be a purely medical or health issue, without significant links to every other sector of society (Ashton and Ramasar, 2002: 219; Marais, 2005: 25). Today, these earlier misconceptions have been replaced by a growing awareness that HIV/AIDS has slowly but surely caused a complex number of subtle and overt changes in society that have resulted over time in a series of accumulated impacts that, collectively, represent the single biggest barrier to development in Sub-Saharan African countries (Barnett and

Whiteside, 2002: 160). Inadequate or inappropriate forms of development increase people's susceptibility to HIV transmission and their vulnerability to the impact of AIDS (Ashton and Ramasar, 2002: 217; Barnett and Whiteside, 2002; Ramasar and Erskine, 2002: 24).

The most direct linkage between health and general development can be found in the strategic roles that supplies of clean water and appropriate sanitation systems play in alleviating many of the adverse effects of the HIV/AIDS pandemic. A lack of access to clean, safe water is the leading cause of death and disease in developing countries, especially individuals with compromised immune systems. For millions of people in Africa, access to sufficient supplies of clean water is a matter of life and death; the situation is greatly aggravated by the impacts of HIV/AIDS and poverty, and the brunt of these combined impacts is borne by individual households (Ashton and Ramasar, 2002: 217; Ramasar and Erskine, 2002: 24; Van Wijk, 2003).

Sectoral Impacts

The HIV/AIDS epidemic has placed increased pressure on the health sector in different countries. In particular, as HIV prevalence rates rise, the demands for care for those living with HIV also rises, as does the toll among health workers. The challenge of sustaining and extending services in developing countries where the number of skilled people is often limited puts sectors, and especially the health sector, under considerable pressure (Van Wijk, 2003; Kamminga and Schuringa, 2005; IRC, 2006).

Recent research has shown that, on average, HIV-positive patients in Sub-Saharan Africa stay in hospital four times longer than other patients. In South Africa, for example, it is estimated that patients affected by HIV and AIDS account for almost 60-70% of total hospital expenditure (Fredericksson and Kanabus, 2006). In poorer African countries, hospitals are struggling to cope as there are often not enough beds available. The situation is complicated by the fact that large numbers of healthcare professionals have also been affected by the pandemic. Botswana, for example, lost 17% of its healthcare workforce due to AIDS between 1999 and 2005, while a study conducted in one region of Zambia found that 40% of midwives were HIV-positive (UNAIDS, 2006a). The lack of professional health care capacity therefore places pressure on home-based care for the terminally ill, especially to those living in rural areas where there is inadequate water and sanitation.

The water and sanitation sector has also been seriously affected by the HIV/AIDS pandemic because demands for these services bring issues of access and affordability to the fore (Ashton and Ramasar, 2002; Kgalushi *et al.*, 2003). Approximately 300 million people in Africa lack access to adequate water supplies, and an estimated 313 million people lack access to appropriate sanitation. In several of the poorest countries, such as Ethiopia, Mozambique, Tanzania, Uganda and Zambia, a low coverage of safe water supply and sanitation is accompanied by a high HIV/AIDS prevalence (Kamminga and Schuringa, 2005: 17). According to the UN Millennium Project, more than 50% of Africans suffer from water-related diseases such as cholera and infant diarrhoea. It has been estimated that the number of people without adequate water supply and access to sanitation could double by the 2015 MDG target if the 'business as usual' approach continues (UNSGAB, 2006).

Impacts on households

The worst impacts of HIV/AIDS in communities are felt at the household level since this is where direct costs are borne and mitigation interventions must be located (Obi *et al.*, 2006). Poor households are extremely vulnerable to the HIV pandemic and also tend to suffer the worst consequences because they are seldom well equipped to mitigate adverse impacts. The traditional "safety net" of poor households becomes greatly weakened when income earners die or are forced to stay at home to care for sick relatives. Many of the victims that are dying have surviving partners who are infected and who are also in need of care. In such cases, desperate relatives that lack access to appropriate information and facilities often spend their savings on inappropriate cures or treatments, worsening the burden of poverty on already poor households (Van Wijk, 2003; IRC, 2006; Obi *et al.*, 2006). A recent study in South Africa found that households that had experienced illness or death in the recent past were more than twice as likely to be poor than non-affected households and were more likely to experience long-term poverty (UNAIDS, 2003).

In many cases, the presence of HIV/AIDS within a family unit means that the household structure will dissolve, as parents die and children are sent to relatives for care and upbringing (Obi *et al.*, 2006). When no adult family members are left to care for orphaned children, the eldest children have to head households and care for their younger siblings. Once orphaned, these children are grieving and struggling to survive without proper parental care (Barnett and Whiteside, 2002: 193) and are then likely to face worsening poverty and poorer health. In communities that have been hard-hit by HIV/AIDS, households not directly incurring a death may nevertheless be affected by having to take in orphans, losing access to resources owned by kin-related "afflicted" households, or by transferring scarce resources to afflicted households (Jayne *et al.*, 2006: 1). The situation is worsened by the fact that many of the orphans may also be HIV positive (Campbell, 2005). At the end of 2005, around 2 million children in Sub-Saharan Africa were living with HIV, representing more than 85% of all children living with HIV worldwide. The vast majority of these children will have become infected with HIV during pregnancy or by being breast-fed by HIV-positive mothers (UNAIDS, 2006a).

Text Box 5: Unintended Consequence of HIV/AIDS Mitigation Strategy.

Effect of Fluoride

One of the unintended consequences of HIV/AIDS mitigation strategies can be found in the fluoride rich areas of South Africa. HIV/AIDS positive women who breastfeed their children are sometimes advised to rather bottle feed with formula. While this prevents mother-to-child-transmission of HIV, it inadvertently exposes children to elevated levels of fluoride in groundwater, which can lead to a condition known as Methaemoglobinemia (Source: Colvin and Genthe, 1999).

Growing reliance on home-based care is escalating and, while this places increased pressure on women, it also entrenches gender inequalities. Women in sub-Saharan Africa that are normally the caregivers of their families, now also have to take care of HIV/AIDS patients while sometimes being HIV-positive themselves (Campbell, 2005). At the same time they are responsible for cultivating crops, provisioning of cash income, cleaning and cooking - often without access to clean water and proper sanitation. Because of the additional work involved in caring for the sick, girls are taken out of school to take on a wider range of household and domestic responsibilities. School enrolment rates for girls therefore tend to decrease in communities with high HIV prevalence rates. This, in turn, decreases access to education, information, knowledge and income generating opportunities, which can increase susceptibility to infection.

Care giving has also heavily impacted older women emotionally, physically and financially as adult children frequently return home when they become sick with HIV/AIDS. In most African cultures, older women are normally helped and supported by their adult children, but HIV/AIDS has placed a heavy burden on them as they now have to care first for their dying children and sometimes grandchildren, and then their orphaned grandchildren, which causes physical and emotional exhaustion that worsens their own medical problems. They therefore often have to rely on children to assist with care giving and household chores.

The management of health and the provisioning of home-based care for people living with HIV/AIDS does not only present a socio-economic and emotional challenge to those that are living in poverty, but is worsened by the lack of safe and sufficient water and sanitation that is indispensable for people living with HIV/AIDS (Potter, 2006).

The burden of care is made heavier by the inaccessibility of water close to the family dwelling. Numerous poor households also depend on small-scale agriculture for their food and livelihood, but family members may be too sick, too young or too poor to farm to feed themselves. The situation is

worsened when water supplies fail as food gardens die and livestock suffer which results in more opportunities to spread the virus.

Often water has to be carried long distances to the house which takes time and effort, a burden borne mainly by women. Time spent on fetching water reduces the time available to care for the sick and in many instances family members that are care givers or patients that are too ill or too weak, are obliged to buy water from vendors at a higher cost. A heavy load is also placed on children that have to fetch water when they return from school and often having to walk long distances, carrying heavy containers with water.

Providing for daily water needs is a burden on households with inadequate services in a number of other ways, in addition to the direct health threats. Most HIV-infected people living in poverty cannot afford to buy clean drinking water. Female family members and care givers therefore mostly struggle to address the infected person's physical needs such as safe drinking water for taking medicine, bathing the patient, washing their soiled clothes and linen and keeping the environment clean. They have often no other choice but to make use of water that does not meet basic health standards by fetching untreated water from streams, dams and other unreliable water resources. This poses a high risk to all household members, including patients who are already immuno-compromised by HIV/AIDS. Illnesses are usually contracted through contaminated water which causes diarrhoea, nausea, vomiting, and weight loss. In the case of infants, the situation can be detrimental as the chance of a child dying from diarrhoea rises when formula feeds are not prepared with clean water, or when cleaning and water handling practices are not hygienic. In urban and urban fringe areas water is often only available from vendors at a price that is usually several times more expensive than the water provided through formal services and of poor quality (Van Wijk, 2003; Kamminga and Schuringa, 2005; IRC, 2006; Phaswana-Mafuya, 2006) and mostly unaffordable for the poor.

In addition to inadequate access to clean water, many rural areas in Africa lack access to adequate sanitation and experience a wide range of health problems such as typhoid, bilharzia, malaria, cholera, worms, eye infections and skin diseases. The situation is worse for immuno-compromised individuals who are now more vulnerable to infections and illnesses that they would normally be able to resist for a longer period of time (Tladi *et al.*, 2002; Phaswana-Mafuya, 2006).

HIV/AIDS also exerts psychological and emotional impacts on individuals and households where stigma and discrimination are commonly manifested in the form of blame and punishment. Infected individuals often experience stigma and discrimination in the home, and women are often more likely to be badly treated than men or children (Bharat and Aggleton, 1999). Families may reject people living with HIV/AIDS, not only because of their HIV status, but also because HIV/AIDS is associated with promiscuity, homosexuality, and drug use (Mujeeb, 1999). In many cases, HIV/AIDS-related stigma and discrimination as been

extended to families, neighbours and the friends of people living with HIV/AIDS. This 'secondary' stigmatization and discrimination has played an important role in the social isolation of those affected by the epidemic, such as the children and partners of people living with HIV/AIDS. In a community context, people often shun or gossip about those perceived to have HIV/AIDS and tend to exclude those that are infected from community-based decision-making. In more extreme cases, it has taken the form of violence (Nardi and Bolton, 1991).

Against the background of the socio-economic impacts on individuals, households and communities, it is understandable that the burden of the disease, combined with HIV/AIDS, increasing poverty, inequity and a lack of water and sanitation increasingly contribute to a 'hopeless situation', especially for women that have to bear the double brunt of being HIV positive and at the same time be responsible for care giving to other family members that are infected (Lundberg *et al.*, 2000; Baylies, 2002).

THE STRATEGIC ROLE OF WATER IN PROVIDING HOPE FOR THOSE LIVING WITH HIV/AIDS

Although water is not a cure for HIV/AIDS, it is the most powerful healing substance known to man and which can contribute to slowing down the progress of the disease, allowing those that are infected to live longer, to live more comfortably, and to be productive for a longer period of time. The world's

responsibility is therefore to ensure that the poor are provided with clean water to give them hope for life as "we shall not finally defeat AIDS, tuberculosis, malaria, or any of the other infectious diseases that plague the developing world until we have also won the battle for safe drinking water, sanitation and basic health care" (Kofi Annan, United Nations Secretary-General confirmed this statement in 2005).

The message of hope for those that are infected primarily lies in acknowledging that appropriate access to supplies of clean water is not only a fundamental human need, but is also a human right (Gleick, 2004). At the same time, access to water enables individuals and communities to access additional health and economic benefits (Obi *et al.*, 2006). It has also long been understood that health is a key determinant of development, "just as development is undoubtedly the best medicine for an unhealthy nation" (Gilbert *et al.*, 1997: 111; Barnett and Whiteside, 2002: 20; Van Wijk, 2003).

The human tragedy and devastation associated with the HIV/AIDS pandemic, and the associated problems caused by a lack of access to clean water and appropriate sanitation systems - as well as poverty - can no longer be ignored by global and national action plans or by any organisation with an interest in Africa's development and the Millennium Development Goals. The United Nations Millennium Declaration confirmed the central role of water and sanitation in sustainable development, emphasizing the major contribution that access to safe drinking water and adequate sanitation can make to poverty alleviation and subsequent disease reduction, and the central importance placed on the adoption of national policies and strategies for integrated water resources management (Van Wijk, 2003; DFID, 2006; UNDP, 2006; UN-HABITAT, 2006; World Bank, 2006).

Tackling the HIV/AIDS, water and poverty crisis in Africa is a long-term task that requires sustained effort and planning, both amongst the international community and within African countries themselves.

It is important that the water and sanitation sector ensures that an HIV/AIDS-sensitive institutional framework is given the highest priority. Strategies should be developed for the integration of HIV/AIDS awareness into all their projects, programmes and activities (Kamminga and Schuringa, 2005; DFID, 2006; IRC, 2006; UNAIDS, 2006b; UN-HABITAT, 2006) and for the reduction of discrimination and stigmatization of the disease to reduce the violation of human rights (Van Wijk, 2003; Kamminga and Schuringa, 2005). Awareness should be raised amongst national policymakers, as well as amongst employees of the water and sanitation service sectors, on how to address HIV/ AIDS through these water and sanitation initiatives (UN-HABITAT, 2006).

The fight against HIV/AIDS calls for a multi-sectoral approach "in which the water and sanitation sector finds its place and plays its role effectively" (UN-HABITAT, 2006: 8) to ensure that demographic and socio-economic changes forced by HIV/AIDS, are taken into account (Kamminga and Schuringa, 2005; DFID, 2006; IRC, 2006; UNAIDS, 2006b). The water and sanitation sector should form strategic partnerships with specialised HIV/AIDS programmes and interventions and support HIV/AIDS initiatives focusing on the most vulnerable segments of communities, such as women, children and the elderly (UN-HABITAT, 2006).

In particular, attention needs to be paid to ensure that poorer communities, who experience difficulty in paying for service delivery, receive assured water supplies (UN-HABITAT, 2006) as "we must begin by recognising that welfare is a global common good" for all (Barnett and Whiteside, 2002: 4), and that it is therefore necessary for governments to ensure that basic human dignity is restored (IRC, 2006).

It is now widely accepted in the water and sanitation sectors that the availability of safe water and sanitation does not automatically lead to improvements in health, but that hygiene promotion and appropriate hygiene behaviours are required as well (Van Wijk, 2003; Phaswana-Mafuya, 2006). National efforts to expand public awareness of the dangers associated with untreated water must therefore also include hygiene awareness and education (UN-HABITAT, 2006). Interventions need to make full use of the opportunities provided in the school curriculum for integrated health and life skills education, and to link this with information around good sanitation, water care and HIV/AIDS. Hygiene education must also be specifically targeted at caregivers and volunteers involved in home-based care (Kamminga and Schuringa, 2005; Phaswana-Mafuya, 2006).

The testing and implementation of reliable water treatment processes that do not require supervision or management interventions should be given high priority. It will help to reduce the potential health risk associated with ineffective water treatment that can be expected as a result of increased mortality of operators of water treatment works (Ashton and Ramasar, 2002; UN-HABITAT, 2006).

Community-based organisations that are dedicated to social equity, provision of essential social services such as water supply and community health promotion that are the main pillars of HIV competence (Kammainga and Schuringa, 2005) need to be strongly promoted. The role of community-based structures should also be re-identified in the new context of municipal service delivery. Equally, local structures that promote accountability by service providers can play a decisive role in mitigating some of the adverse impacts of HIV/AIDS as there is an immense reservoir of goodwill, experience and positive thinking that must be mobilised if the needs of the poor are to be addressed effectively (Kgalushi *et al.*, 2003).

Ongoing training of additional staff in the water and sanitation sector is necessary to ensure that the same level of skilled staff such as operators at water treatment works and sewage treatment works are available to avoid the accompanying deterioration in the quality of potable water supplies in urban and rural areas when employees are lost as a result of AIDS deaths. People living with HIV/AIDS should also be employed effectively in water and sanitation improvement programmes where they can act as peer educators, helping to break down prejudices and providing additional income-generation opportunities (Van Wijk, 2003; Kammainga and Schuringa, 2005).

The situation in Africa will only start to improve when serious global and national steps are taken to address the water and sanitation situation in the context of HIV/AIDS and the increasing poverty related to the pandemic. Concerted development and implementation of the appropriate strategies and co-operation between global institutions, national governments, communities and individuals is crucial for achieving the Millennium Development Goals that have been set for 2015.

Conclusion

The ever increasing HIV/AIDS epidemic is causing significant losses of human capital that pose a serious threat to all forms of development in Southern Africa. Efforts directed at minimizing the destructive social crises and maximizing the potentially constructive outcomes of the pandemic have recognized the indispensable role that the provision of wholesome supplies of water and appropriate sanitation services have in strengthening the ability of communities to withstand the impacts of increased AIDS-related mortality, and helping to ensure a longer life for people living with HIV/AIDS. Tackling the HIV/AIDS, water and poverty crisis in Africa is a long-term task that will require sustained effort and planning, both amongst the international community and within African countries themselves. It is however alarming to note that the connection between HIV/AIDS and water resource management has not yet found its rightful place in science literature on the subject. As the tragedy of the pandemic unfolds, we are constantly being confronted by challenges to our prevailing paradigms. If we as water professionals are to play a meaningful role in attenuating or reducing the impact of the pandemic, we will all need to broaden our perspectives on HIV/AIDS and collaborate more closely to ensure that our knowledge and insights are fully deployed to combat the HIV/AIDS pandemic. If we fail to achieve this high level of professional synergy and cooperation, the tragic consequences will continue to haunt the continent.

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