Business AIDS, and Africa[1]

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The African epidemic

The emergence of the disease

In 1981, the *New York Times* reported an outbreak of a rare cancer among gay men in California and New York. The same year, a technician at the U.S. Centers for Disease Control (CDC) noted increased demand for the drug pentamidine, used to treat patients with *pneumocystis carinii* pneumonia (PCP). PCP was on the rise not only among gay men, but also among drug users. Within a year, a new syndrome had been identified and named first as GRID (gay-related immune deficiency) and then AIDS (acquired immune deficiency syndrome).

Early suspicions that AIDS was caused by drug abuse proved unfounded and, by 1983, a retrovirus had been identified as the probable cause of the syndrome. It was soon discovered that the human immunodeficiency virus (HIV)—named in 1986—was transmitted through bodily fluids, mainly blood, semen, vaginal fluid, and breast milk, passed from person to person during sexual intercourse, pregnancy, or breastfeeding; through blood transfusion; or by sharing used needles contaminated by infected blood. The oldest HIV sequence yet discovered dates from the 1950s; however, according to Los Alamos National Laboratory in the United States, the virus probably emerged around 1930 when most scientists believe it crossed from chimpanzees to humans.[ii]

At first, HIV/AIDS was popularly believed to be a “gay disease” and to be principally a problem for the West. By 1987, however, more than one hundred-twenty countries had reported more than 60,000 cases to the World Health Organization (WHO). Seventy-seven percent of reported cases were in the Americas, 12 percent in Europe, and 9 percent in Africa. Ten years later, the reporting epicenter of the epidemic had shifted dramatically. By December 1996, UNAIDS

estimated that over 60 percent of the 21.8 million people infected with HIV were living in sub-Saharan Africa. It observed how rapidly mini-epidemics could explode and predicted a grim future for many African countries unless action was taken quickly.[iii]

Today, the situation continues to worsen. In December 1999, UNAIDS reported that 8 percent of adults in sub-Saharan Africa were HIV positive, with heterosexual sex the dominant means of transmission. It called for "massive national and international efforts… to end the stifling silence that continues to surround HIV in many countries [and] to explode myths and misconceptions that translate into dangerous sexual practices."[iv] Eleven million Africans have already died of AIDS, and the world's twenty worst-hit countries are all in Africa.

The importance of health

Health is critical to the development of modern societies. Improved life expectancy triggers a fertility transition, as families choose to invest intensively in fewer children, based in part on an increased confidence that their children will survive for longer. Education thus becomes increasingly valued, in turn promoting higher productivity and income. Healthy children are also more receptive to education, and are likely to make more active and enterprising workers as adults. Further, people who expect to live on into old age also need to save for retirement, which provides a significant boost to domestic funds available for investment in business.[v]

The effects of improved health are thus substantial. Evidence from a range of studies shows that, for a five-year increase in life expectancy, a developing country can expect to receive a sizable boost to the growth rate of its per capita income of between 0.3 and 0.5 percent annually.[vi] In short, good health helps people become richer and better educated, just as income and education allow people to take better care of their health. This positive feedback encourages a "virtuous spiral" to develop that can lead, in the right policy environment, to rapid economic and social development.

AIDS, however, is rapidly reversing the health gains made in Africa during the twentieth century. Life expectancy is falling at unprecedented speed. Only 44 per cent of sub-Saharan Africans are now expected to reach their sixtieth birthday, compared with 72 percent of people worldwide.[vii] An African child born today can expect to live for only 48.9 years, compared with a world average of 66.7 years.[viii] In addition to AIDS, Africa faces many other serious health problems, such as malaria and a daunting number of killer childhood diseases. The region's health crisis threatens its security and leaves its people unable to make the most of their opportunities. Declining standards of health have an impact on the education and prospects of young people. It impedes the operation of the labor market, diminishes the availability of capital, and undermines the strength of business. And it is likely to have an impact on all aspects of governance and public administration. Poor health is significantly depressing Africa's prospects in the new century, a situation that will worsen as the vicious spiral—the reverse of the virtuous spiral—continues to take hold and gain momentum.

The economic impact of HIV/AIDS

A number of features of HIV/AIDS are likely to exacerbate its economic impact. In Africa, heterosexual sex is the dominant means of transmission. As a result, the disease strikes adults hardest, with the economically active and relatively mobile being the main drivers of the epidemic. The long period (eight to ten years on average) during which an infected person shows no symptoms helps the disease to spread with astonishing rapidity. Once rates of new infection reach a critical threshold, they tend to accelerate quickly, reaching 20 percent to 40 percent of adults in parts of many countries within ten years. In just a decade, then, HIV/AIDS can ruin the prospects for a large swath of a country's population.[ix]

Worldwide, more than 80 percent of those dying of AIDS are aged 20-59 years. Their illness has an immediate impact on their families, which often withdraw children from school, sell assets, and exhaust savings to provide and pay for health care and then funeral costs. The death of a productive adult leaves dependents in a critical situation. There are over eight million AIDS orphans in Africa, and orphans make up 15 percent of all children in some African cities[x]. Africa is now home to 95 percent of the world's orphans.[xi] These children receive less care and schooling, significantly reducing their prospects in later life.[xii] In many African countries, adolescent girls face particularly serious risks, due to the likelihood that they will have sex with older men (in a situation frequently characterized by an imbalance of power in favor of those men). In Kisumu, Kenya, for example, UNAIDS recently found 3 percent of males aged 15-19 infected, against 23 percent of females—despite these young women reporting relatively few sexual partners. The same study showed that less than 25 percent of men regularly used condoms outside marriage.[xiii]

The disease also strikes at areas critical to African society and its development. Thirty percent of Malawi and Zambian teachers are infected, for example, while in many countries AIDS exacts a heavy toll on urban professionals.[xiv] A study in Rwanda in 1997 showed the likelihood of HIV infection for a pregnant woman to be 38 percent if her husband worked for the government, 32 percent if he was a white-collar worker, 22 percent if he was in the army, and 9 percent if he was a farmer.[xv]

Businesses risk losing senior staff and face the prospect of increased direct costs, as they spend more on training, health care, funerals, insurance, and absenteeism. In Zimbabwe, for instance, insurance premiums generally doubled between 1996 and 1998, while Botswanan companies expect their AIDS-related costs to rise to 5 percent of the wage bill by 2004.[xvi] Businesses must thus cope with rising costs while their customer markets are under pressure: the expenditure on normal goods and services of households in which someone is suffering from AIDS is often halved.[xvii] Thai businessman, politician, and AIDS campaign pioneer Mechai Viravaidya makes the point succinctly: "dead customers don't buy."[xviii]

It is not easy to estimate the wider economic impact of AIDS on national and regional economies. However, there is growing concern that AIDS increases political and economic instability. At the instigation of the United States, the UN Security Council recently put a health issue on its agenda for the first time: AIDS. “In already unstable societies,” commented UN Secretary General Kofi Annan, “this… is a sure recipe for more conflict. And conflict, in turn, provides fertile ground for further infections. The breakdown of health and education services, the obstruction of humanitarian assistance, the displacement of whole populations and a high infection rate among soldiers—as in other groups which move back and forth across the continent—all these ensure that the epidemic spreads ever further and faster.”[xix]

According to business…

The data

By including questions on HIV/AIDS for the first time in a major cross-national business survey, the Africa Competitiveness Report (ACR) allows us to explore the business sector’s perception of the AIDS epidemic, its effect on business, and the business response.

- The survey asks business leaders in thirty African countries to estimate:
- the percentage of their work force that has died of AIDS-related illnesses now; had died five years ago; and will have died in five years’ time;
- the percentage of their work force that is HIV positive; and whether these HIV-positive people are managers or workers, as well as whether they are highly educated;
- whether, due to HIV/AIDS, their firm is suffering a burden of increased health care costs; time off work due to the effects of the illness or to attend funerals; reduced skill levels among their work force; increased training costs;
- whether, as a response to death and disability from HIV infection, their firm has had to hire extra employees in management and technical positions; and/or laborer or clerical positions; or
- whether their firms provides routine HIV screening; free condoms; HIV counseling, or education.

The responses to these questions are summarized, country-by-country, in tables 1 and 2, alongside data from UNAIDS showing the “real” state of the epidemic in 1997. Comparisons are therefore possible between the perception of business people and the best scientific estimates of infection rates and AIDS deaths.

Perceptions of HIV prevalence

Business leaders tend to perceive HIV infection levels to be lower than those recorded by UNAIDS among those aged 15-49 (figure 1). The average Africa Competitiveness Report figure (calculated as a population-weighted average for the twenty-nine countries where UNAIDS data are available) is 4.26 percent, against a UNAIDS average of 6.16 percent. The difference is sizable (and even more so, given that the UNAIDS data refer to 1997, two years earlier than the ACR data). The difference can be accounted for in one of two main ways: either respondents are in "denial" and are underestimating the prevalence of HIV; or the proportion of infected workers is lower than the proportion of infected adults, with a high number of those infected not working for one reason or another.

Support for the latter hypothesis is provided, to a certain extent, by the fact that the cross-country correlation between reported and actual infection rates is relatively high (0.74), and the difference between reported and actual infection levels does not vary systematically across countries. This suggests that the ACR data replicate the general pattern of HIV prevalence across Africa and that business leaders' estimates are indeed related to the extent of the epidemic in their country, not based on wildly inaccurate guesses.

However, there is also evidence to support the view that these ACR figures reflect a degree of "denial". In many countries, leaders expect only a modest increase in the number of workers dying of AIDS, which is at odds with the epidemiology of a disease with such a long latency period. In some countries, with mature epidemics, the number of people dying may indeed remain fairly constant, but in other African countries, increases in mortality are rapid. Many countries have ten or more people living with HIV for each person who has already died from the disease. This is an indication that the full fury of the epidemic has yet to be felt, – and that business leaders are unaware of this. Respondents also generally consider HIV prevalence to be higher among workers than among managers, and also higher among the uneducated than those with a university degree. This seems to fly in the face of the reported positive association between HIV and socioeconomic status in the early stages of the African epidemic, and suggests that respondents (who are all managers) are denying the potency and pervasiveness of the epidemic

The effects of the epidemic

Currently, there is no correlation between the severity of the epidemic (as measured by UNAIDS or ACR estimates) and the ACR competitiveness index. In other words, this survey provides no evidence that the HIV/AIDS epidemic diminishes national competitiveness. This result could be interpreted in a variety of ways. First, the epidemic may not be having any discernible macroeconomic impact *yet*. Second, there may be reasons why AIDS is hitting more competitive economies harder. They are likely to be more open to trade, with higher levels of internal and international migration, for example. They are also likely to have higher income levels, which can translate into high rates of multiple sexual partnering, as people (mostly men) use their wealth to

maintain mistresses or visit brothels. Economic development, in other words, may be leading to rates of infection that partially offset, but do not yet overwhelm, the economic advantage.

About half of the survey respondents report that illness and disease impose costs on their businesses. There is also evidence that businesses think the costs are increasing. While only 6.6 percent think the costs were significant three years ago, 9 percent think the costs are significant today, and 15.4 percent think the costs will be significant in two years' time. Employers show a considerable degree of concern about the impact of AIDS on various areas of their business. Predictably, they are most worried about employees taking time off due to sickness or to attend funerals (figure 2). There is a fairly strong correlation between the impact of the HIV epidemic on the costs of running businesses and perceptions about the severity of the epidemic (see figure 3). Respondents are least concerned when they consider the effects of the epidemic on the central competencies of their business. Sixty-three percent expect that skill levels will decline, but only 47 percent expect this to have an impact on the quality of their product, and only half believe that HIV/AIDS will make it difficult for them to plan for the future.

The results of the ACR are consistent with earlier studies. Tyler Biggs and Manju Shah, for example, surveyed nearly a thousand firms in Ghana, Kenya, Tanzania, Zambia, and Zimbabwe. They concluded that the effects of HIV and AIDS on firms, as measured by increased staff turnover, are relatively minor, though this may change as the epidemic continues. Professional staff are proving most hard to replace, for example, with firms taking an average of nearly 24 weeks to replace a deceased professional, compared to two to three weeks for less skilled staff.[xx]

Responding to the epidemic

The deficit model

The ACR provides some evidence of at least modest denial among African business leaders about the extent of the epidemic, bolstered by the fact that many are not yet feeling the full effects of the epidemic on their bottom line. Businesses, therefore, are likely to be contributing to the "world of silence" that UNAIDS, and many other observers, have complained still surrounds the epidemic. "The silence is extraordinary…" comments John Caldwell. "There is less public or media discussion of AIDS in Zimbabwe, with an adult seroprevalence level approaching 30 percent, than there is in Thailand, with a level of 2 percent."[xxi]

The African experience is consistent with initial approaches to the epidemic in Western countries, where early government information campaigns were often embarrassing failures. They relied on the deficit model of the public's understanding of science, an assumption that the public suffers from a deficit of knowledge, which can be corrected through education.[xxii] The result is one-way communication from experts to the public, with the style and content of the communication dictated by the professional agenda, rather than the public's needs. The British government, for example, reacted to the onset of the AIDS epidemic with a misguided public

information campaign. The advertisements, which ran initially in cinemas, were allusive rather than frank; using tombstones and doom-laden music as a metaphor for the impact that HIV/AIDS would have on adolescents' sex lives. The advertisements were widely ridiculed by the target audience, which saw them as an attempt by authority figures to coerce young people into celibacy. Educational efforts of this kind were successful in raising awareness, but they did not promote the changed behavior needed to slow the progress of the epidemic.

Successful campaigns, meanwhile, were produced in opposition to establishment efforts. Among gay men—and especially in the United States, Australia, and the UK—changes in behavior were rapid because information was cycled *through* the gay community *by* the gay community. Groups, like the Terrence Higgins Trust in the UK, sprang up and showed that it was impossible (and counterproductive) to talk about sex without being (at least a little) rude. These groups worked in highly *entrepreneurial* ways. They discovered the importance of dynamic marketing, of working from an understanding of the position of the target audience, and of developing two-way communication. Instead of merely warning of the seriousness of the disease, they were explicit about what behavior was safe and what was not. They explained the nature of the risks that different people faced and proposed strategies for minimizing exposure. In most cases, these groups heavily promoted the use of condoms and often distributed them in new ways. They thus sent an explicit message to their target audience: that they were not pro or antisex—just pro-safe sex.

Awareness of HIV/AIDS is now high in most African countries, but this awareness has been slow to translate into changed behavior. Instead, an extraordinary number of myths and conspiracy theories have flourished. Reliance on the deficit model has dampened open and engaging discussion of the disease and awakened suspicions that those talking about AIDS nurse a secret agenda. Openness is now needed and, as in the West, this openness is likely to come first from non-governmental organizations (NGOs) and other groups operating outside the establishment. Their initiative will translate into growing pressure on governments and the media. As a result, increasing numbers of people will benefit from campaigns that focus on the availability of means of prevention, the skills to use these methods, and the social support for their use. These campaigns can be developed and rolled out rapidly, and the evidence suggests they bring fast results.

Options for action

There is now evidence from several African countries that have taken significant steps to combat the AIDS epidemic. Senegal is an example of the success that can be achieved from swift action at an early stage. AIDS was first reported in 1986. By 1987, decisive action had been taken, with all blood for transfusion screened for HIV antibodies. Between 1992 and 1996, the government invested US$20 million in AIDS prevention programs, with a tax break for condoms (reducing their price by as much as 25 percent) and action to involve the media, religious leaders, NGOs, and local communities in the response. Religious leadership played a critical role. In March 1995, Senegal's senior Islamic leaders declared that AIDS was not divine punishment for

immoral behavior and called for everyone to be provided with full access to AIDS information. Sex education was introduced in primary and secondary schools in 1992 and efforts were made to contact young people through proven channels of influence such as youth groups and religious and community organizations.

Reported awareness levels in Senegal are now very high. Over 95 percent of secondary school pupils are aware of AIDS and know at least two ways of preventing it. Condom use has also increased dramatically—from around 1 percent to some two-thirds of men, and half of women, using condoms for casual sex. Infection rates of all sexually transmitted diseases, including HIV, have remained low, with only a few groups, such as prostitutes, showing high rates of infection.[xxiii]

Senegal acted quickly, but initiatives can also deliver big benefits when the epidemic is much further advanced. In the West, for example, the gay community achieved remarkable success in reducing infection levels, although it was unable to act until the disease was already rampant.[xxiv] In Africa, Uganda seems to be achieving favorable results for its belated attempt to control the epidemic. For many years, the country failed to act. The first AIDS cases were officially reported in 1982, but according to the Uganda AIDS Commission, “between 1980 and 1986, government and public response to the new disease was initially *ad hoc* and slow. During this period, government was silent about the epidemic and virtually nothing was done.” In 1990, however, a national task force was set up to tackle the epidemic and in 1992 the Uganda AIDS Commission was established. By 1998, a National Strategic Framework for HIV/AIDS Activities was adopted.[xxv] An updated strategic framework for 2000-05 was published recently.

Uganda’s vigorous prevention campaign has focused on educating people about safe sex, in their own language. CNN reports one initiative—the Straight Talk Foundation —which produces a weekly radio program listened to by 1.5 million young people. “Straight Talk” forcefully debunks sexual myths and helps young people learn how to negotiate their way out of difficult sexual situations. It works closely with youth groups and youth-friendly health clinics, and allows young people to “speak their mind” on air.[xxvi] The success of this approach is shown in rapidly declining infection rates among some groups. One testing site in Kampala, for example, saw infections among women aged 15-19 drop from 26 percent in 1992 to 9 percent in 1996. The Uganda AIDS Commission believes national infection rates among women of this age group have probably halved.

The success of prevention campaigns in some countries—combined with the uncontrolled nature of the epidemic in many more—has inspired increasing levels of commitment to fighting AIDS in Africa. The International Partnership against AIDS in Africa was launched in December 1999 in an attempt to coordinate a new regional response. The partnership brings together a number of multilateral agencies, twenty African countries, a dozen bilateral development agencies, and a broad cross-section of African NGOs. The partnership has agreed to concentrate on four areas of action: building political support at the highest level; helping each country develop a national strategy for combating AIDS; increasing resources available for programs; and building regional

and national capacity to tackle AIDS.

A role for business

The Africa Competitiveness Review offers African business leaders the opportunity to assess their role in the fight against AIDS. The data seem to show a reasonable level of awareness about the disease, combined with some denial about the extent of the epidemic and the ferocity of its expected future impact. The business response to the epidemic is currently limited and seems to be another outgrowth of the deficit model. Business leaders tend to think the disease is more a problem among low-skill employees than among themselves, and workplace efforts tend to concentrate on education for prevention rather than the delivery of services that relate directly to HIV status and transmission (i.e., condom provision and HIV testing).

Business responses vary markedly from country to country. On average, nearly 14 percent of businesses surveyed provide routine HIV testing, with a high of 40 percent in Mali and a zero figure for Algeria and Ethiopia. Free condoms are provided by just over a quarter of all firms in the survey, and 37 percent provide HIV counseling and education. These figures are modestly correlated with perceptions of the epidemic's severity, unlike the provision of HIV screening, which is mildly negatively correlated.

Yet businesses are exceptionally well placed to join the fight against AIDS—both on their own and in partnership with the public sector and NGOs. They have unique human, financial, and organizational resources. Their marketing people are skilled at using communication to change human behavior; they are experienced at conducting and using market research; and their extensive networks give them influence at national levels, as well as at the grassroots. They are not necessarily tied to an establishment agenda. They are also placed as well as any NGO to break through the silence.

Business intervention could make a real difference in four key areas:

1. Condom promotion—the reinvention of the condom is at the heart of a successful prevention strategy. Business packaging, marketing, and promotion skills can help promote the product in innovative ways, especially to young people.

2. Consumer education and research—education initiatives need to start with a clear understanding of the target market's needs and display a willingness to talk in a language to which people can relate. Business can use its proven techniques for building and communicating brands, as well as its PR and advertising capabilities. The same sophistication used to market business brands needs to be applied to marketing messages about HIV prevention and AIDS care.

3. Workplace action—the workplace provides an excellent environment for the promotion of HIV prevention, better health care, and education. Larger businesses can also influence

the efforts of other concerns in their supply chain, and send strong signals to the communities in which they operate, by instituting policies to discourage stigmatization, for example.[xxvii]

4. Lobbying for change—the economic power of business translates into considerable political influence. Many big businesses have a head office in the capital running operations across the country. This allows them to develop a detailed understanding of the progress of the national AIDS epidemic, knowledge that can be used to educate and motivate policy makers to take action on AIDS.

Some businesses are prepared to show leadership. The South African Business Coalition on HIV/AIDS, for example, was launched in Johannesburg in February 2000 to coordinate a new level of response to the problem. Individual businesses have also taken bold steps. In Zambia, for instance, Barclays Bank has reacted to a mortality rate that has risen from 0.4 percent to 2.23 percent. It provides education, free condoms, and medical care. It also has strict policies on sexual harassment and stigmatization.

According to the *New York Times*, however, other companies are less sympathetic. At Chilanga Cement, also in Zambia, around 2.5 percent of employees die each year. The chief executive, however, describes the impact on the bottom line as “almost negligible,” arguing that workers can be replaced easily and that deaths cut costs. “It’s achieving what we want,” he says. “Natural wastage is allowing us to reach our manning levels.” The company has prevented workers from going to funerals unless a wife, parent or child has died; has managed to cut health care costs in its on-site clinic by banning “high-powered expensive drugs”; and has, after a three-month “firefight” with the worker’s union, reduced the benefits it pays when a worker dies.[xxviii]

Chilanga is looking to cut staffing levels and reduce costs, an expression of a lack of confidence in the future. A similar finding emerges from Tyler Biggs and Manju Shah’s study. In 37.5% of cases, firms had decided not to replace a deceased professional, while a deceased unskilled worker was not being replaced in 51% of cases. Poor health, however, is part of the cause of the poor performance of African economies. Those trying to encourage business to act against the epidemic, therefore, should broaden their approach beyond an individual business’s bottom-line. Businesses with confidence in the future need a healthy workforce and customer-base to grow, but they are also reliant on a healthy business environment. As the AIDS epidemic deepens, perceptions of Africa’s future prospects (both within the continent and in the rest of the world) will surely worsen and the chances of an “African miracle” continue to recede.

In defense of society

In a modern market economy, businesses are free to act in what they see as their own interests. Some will define these narrowly and, like Chilanga Cement, concentrate on minimizing the impact of the epidemic. Others, however, may believe that it will prove impossible to insulate their companies from the disease. They may also define their interests more broadly. For many

companies, affiliation with employees, communities, or target markets is now essential to protecting the bottom line. They may choose to help protect the lives of workers to demonstrate commitment to the work force, which they hope will be reciprocated. They may wish to help strengthen the communities in which they are located to protect an intangible “license to operate.” They may see action on AIDS as a powerful addition to their “marketing mix,” for example by helping to develop a stronger voice in the youth market. Finally, most multinational operators are now aware of the power of the global consumer. For these companies, reputation and brand are increasingly important and fragile assets.

As the epidemic worsens, businesses will find it increasingly difficult to carry on business as usual by discarding sick workers and cutting benefits. At the same time, the advantages of an active engagement in the struggle against AIDS will increase. Africa’s business community has a remarkable opportunity to step forward and act as a leader in the fight against HIV/AIDS. Such an effort will surely have an impact. Indeed, in countries where businesses form a common front with government and nonprofit organizations, this impact will be sizable, immediate, and of great value to national prospects. Moreover, these efforts will be noticed and remembered, and are likely to be profitable.

Businesses are programmed to engage with opportunities and respond to them more vigorously than they do to threats. A campaign against HIV/AIDS offers business leaders the chance to set a positive agenda, to improve relationships with workers and consumers, to build brands and to invest in the reputation of the business community as a whole. A growing proportion of the world’s adults have grown up in the shadow of the HIV. The coming of the epidemic is the universal story of one generation. Its defeat should be the narrative that binds the next.

[i] The authors are indebted to Tim Brown for helpful ongoing discussions and for his thoughtful comments on an early draft of this essay.

[ii] B. Korber et al., *Timing the Origin of the HIV-1 Pandemic.* Paper presented at 7th Conference on Retroviruses and Opportunistic Infections, February 1, 2000. A controversial alternative view of the origins of HIV has been propounded in Edward Hooper’s *The River: A Journey to the Source of HIV & AIDS* (New York: Little Brown & Co., 1999), and a research program to examine these claims was announced recently.

[iii] HIV/AIDS : The Global Epidemic, UNAIDS December 1996.

[iv] *Global Summary of the HIV/AIDS epidemic*, UNAIDS, December 1999.

[v] See D. E. Bloom and J. G. Williamson, “Demographic Transitions and Economic Miracles in Emerging Asia,” *World Bank Economic Review*, 12: 3, (1998): 419-55; D. E. Bloom and J. D. Sachs, "Geography, Demography, and Economic Growth in Africa," *Brookings Papers on Economic Activity*, 2 (1998): 207-95; D. E. Bloom, D. Canning, and P. N. Malaney, “Demographic Change and Economic Growth in Asia,” *Population and Development Review*, forthcoming 2000; and D. E. Bloom, D. Canning, and B. Graham, “Health and Life-Cycle Saving,” March 2000, mimeo.

[vi] See D. E. Bloom and D. Canning, "The Health and Wealth of Nations," *Science* (February 18, 2000). See also World Health Organization, *World Health Report 1999,* Geneva, 1999.

[vii] D. E. Bloom, A. Rosenfield, and River Path Associates, *A Moment In Time: AIDS and Business* (American Foundation for AIDS Research [amfAR], November 30, 1999). (www.riverpath.com)

[viii] United Nations Development Programme (UNDP), *Human Development Report 1999* Oxford, UK: Oxford University Press, 1999

[ix] Social and Economic Issues of HIV/AIDS in Southern Africa, Dr. Rene Loewenson and Professor Alan Whiteside, Southern Africa AIDS Information Dissemination Service, March 1997

[x] Intensifying Action against HIV/AIDS in Africa: Responding to a Development Crisis, Africa Region/The World Bank, June 1999

[xi] "Children Orphaned by AIDS: Front-Line Responses from Eastern and Southern Africa," UNAIDS/UNICEF, December 1999.

[xii] Loewensohn and Whiteside, op cit.

[xiii] Differences in HIV spread in four sub-Saharan African cities —Lusaka, September 14,1999, UNAIDS

[xiv] Africa Region/The World Bank, June 1999, op cit.

[xv] "AIDS Stalking Africa's Struggling Economies," *New York* Times (November 15, 1998).

[xvi] AIDS in Africa, UNAIDS, Johannesburg, November 30,1998.

[xvii] A. M. Kimball and M. Thant, "Viewpoint," *The Lancet*, 347 (1996): 70-72

[xviii]Bloom, Rosenfield, and River Associates, op cit.

[xix] "In Address to Security Council, Secretary-General Says Fight Against Aids In Africa Immediate Priority In Global Effort Against Disease," United Nations Press Release, SG/SM/7275, SC/6780, January 6, 2000.

[xx] Tyler Biggs and Manju Shah, "The Impact of the AIDS Epidemic on African Firms", *RPED Discussion Paper No. 72,* Regional Program on Enterprise Development, The World Bank, January 1997

[xxi] J. C. Caldwell, "Rethinking the African AIDS Epidemic," *Population and Development Review*, 26, 1 (March 2000): 117-35.

[xxii] For more detailed discussion of the deficit model, see, for example, A. Irwin and B. Wynne, *Misunderstanding Science?* Cambridge: Cambridge University Press, 1996.

[xxiii] More detailed analysis of Senegal's success story is contained in "Acting Early to Prevent AIDS: The Case of Senegal," UNAIDS, 1999, from which material for this case study is drawn.

[xxiv] D. E. Bloom and S. Glied, "Projecting the Number of New AIDS Cases in the United States," *International Journal of Forecasting* (Special Issue on Population Forecasting), 8 (November 3, 1992)" 339-66.

[xxv] "HIV/AIDS in Uganda," The National Aids Documentation and Information Center, Uganda AIDS Commission, 1999.

[xxvi] "Uganda's Successful Anti-AIDS Program Targets Youth, September 3, 1999, CNN.com.

[xxvii] Bloom, Rosenfield, and River Path Associates, op cit.

[xxviii]"AIDS Stalking Africa's Struggling Economies," *New York Times*, November 15,1998.

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