

**Exploring the Implications of the HIV/AIDS Epidemic for
Educational Planning in Selected African Countries:
The Demographic Question**

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I. SUMMARY

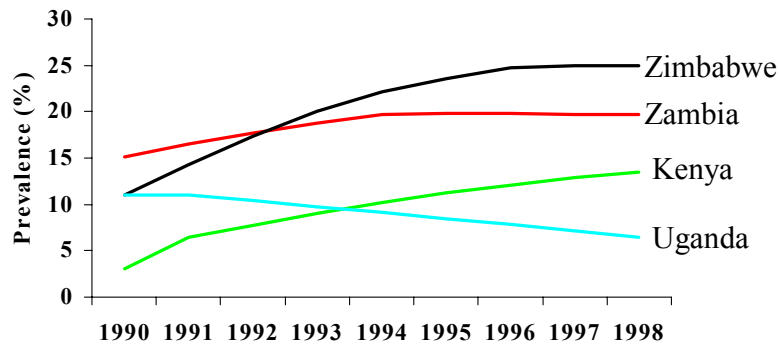
The HIV/AIDS epidemic is causing considerable turbulence in the education sector in many countries in eastern and southern Africa. Turbulence, with its imagery of swirling, rapid change, is an appropriate term in this case. The impacts of HIV/AIDS on the education sector will assuredly be profound but not necessarily all in the same direction. How African countries respond to this turbulence will affect both their ability to improve educational services for African children as well as the future course of the HIV/AIDS epidemic.

This working paper explores some of this turbulence in four countries: Zimbabwe, Zambia, Kenya, and Uganda. The analysis is based on applications of the AIDS Impact Model (AIM). At least two population projections are used for each country. The first projection is hypothetical and assumes that the HIV/AIDS epidemic never existed. This is designated the “Without AIDS” projection, for example, Uganda-Without AIDS. The second projection for each of the four countries traces the historical development of the epidemic as closely as possible and then projects forward to 2010. This projection is designated the “With AIDS” projection, for example, Uganda-With AIDS.

As structured, these projections compare the current and projected future situation with a hypothetical scenario in which there is no HIV/AIDS epidemic. This is the best way to answer the question: What is different about the education sector due to HIV/AIDS than would have otherwise been the case? This approach does not show the impact on the education sector of strengthening efforts now to combat the epidemic. To do this would require a different approach and a longer time frame, since new HIV infections averted by improving prevention programs today would not cause a significant difference in the projected number of school age children or teachers for at least 10 years.

HIV/AIDS epidemics vary widely throughout the region. The graph shows estimates of HIV prevalence among 15 to 49 year olds in the four countries over the 1990-1998 period. In Zimbabwe, prevalence may have reached 25 percent by 1998. In Zambia, prevalence probably peaked earlier in the 1990s at over 19 percent and then remained at that level for the duration of the decade. In Kenya, prevalence seems to have risen steadily throughout the 1990s and stood at about 13.5 percent by 1998. Uganda is the anomaly. HIV prevalence seems to have dropped consistently throughout the decade, falling to the 6 to 7 percent range by 1998.

HIV/AIDS Epidemics Vary . . .
Estimated Adult HIV Prevalence
In Four African Countries, 1990-1998



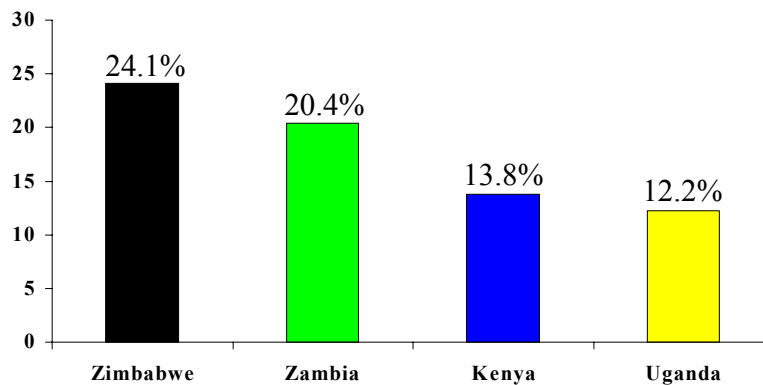
In most countries, the most severe turbulence in the education sector as a result of HIV/AIDS lies in the future, not the past. There is often a long lag between HIV-infection and the development of full-blown AIDS and death. The lengthy incubation period means that many of the impacts of high levels of HIV infection in the 1990s will not be felt until after 2000. In the education sector, HIV/AIDS-driven turbulence will be much more severe over the 2000-2010 decade than it has been in previous years.

Demographically, the HIV/AIDS epidemic affects the size of the school age population in different ways. First, and most importantly, the epidemic results in high death rates among reproductive age adults. Consequently, there are many fewer births in any given year. As children grow older and reach school age, there are fewer of them than would have been the case in the absence of HIV/AIDS. Second, about one-third of infected mothers transfer HIV to their infants, either during pregnancy, when giving birth or while breastfeeding. Most of these children die within a few years and never reach school age.

HIV/AIDS will affect the demand for educational services in countries throughout the region. This will happen for many reasons. For example, HIV/AIDS-affected households will have fewer resources available for schooling than unaffected households. But most importantly, the exceedingly high death rates that result from HIV/AIDS will have a profound demographic impact on the region and will affect the growth of the school age population. The epidemic will affect the size of the school age population in all the countries, although the impact will be greatest in the highest prevalence situations.

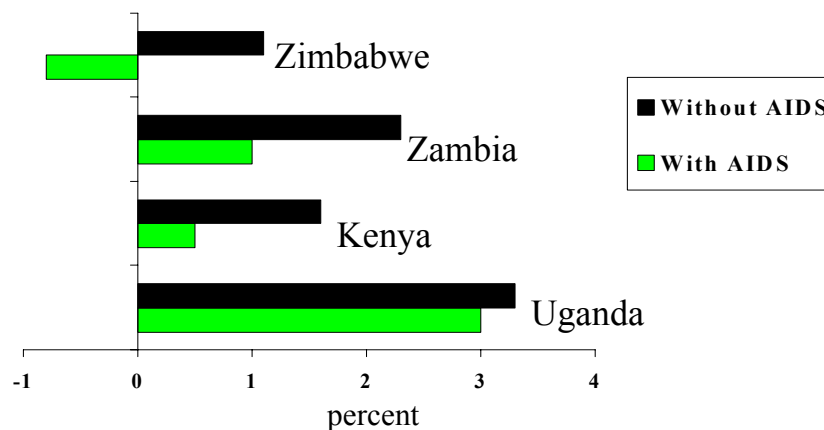
By Zimbabwe, for example, the size of the primary school age population would be 2.98 million in 2010 under the Zim-Without AIDS projection but 2.27 million under the Zim-With AIDS projection, a difference of 24 percent. In Zambia, the primary school age population would be 2.71 million in 2010 without AIDS but 2.16 million with AIDS. In this case, the differential would be more than 20 percent. In Kenya and Uganda, the differences in the size of the primary school age populations in 2010 between the Without AIDS and the With AIDS projections would be 13.8 percent and 12.2 percent respectively.

HIV/AIDS Affects Education Demand . . . Percentage Reduction in Size of Primary School Age Population by 2010



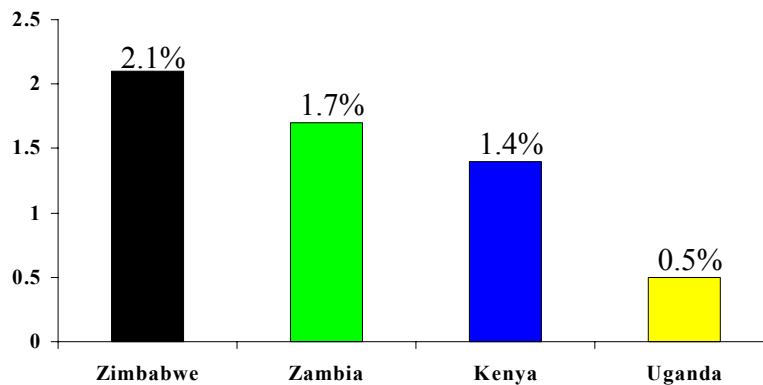
The HIV/AIDS epidemic will affect the growth rate as well as the size of the school age population. Sub-Saharan African countries have had the highest fertility rates and the highest population growth rates in the world for a long time. Consequently, in most countries, educational planners have had to deal with the demands of a rapidly increasing school age population. But HIV/AIDS is changing this situation. The graph indicates average annual growth rates for the primary school age population under the two population projections for the 2000-2010 decade. In Zimbabwe, the combination of declining fertility and extremely high HIV prevalence means that the primary school age population will actually be declining in size every year over the 2000-2010 decade. In Zambia and Kenya, the growth of the primary school age population would slow down markedly because of the HIV/AIDS epidemic. The situation is different in Uganda because HIV prevalence peaked relatively early and then entered a period of sustained decline. There, the primary school age population will continue to grow rapidly.

HIV/AIDS Affects Education Sector Growth...Average Annual Growth Rate of Primary School Age Population, 2000-2010



The HIV/AIDS epidemic will affect the supply of educational services in Africa through increased mortality. Virtually all HIV-infected persons eventually die from AIDS. Little direct empirical data exists on HIV/AIDS mortality and morbidity among teachers. The best assumption in the absence of more information is that teacher and educational officer loss from AIDS will parallel what is happening in the overall adult population. As shown on the graph, Zimbabwe would annually lose about 2.1 percent of its teachers and education officers to AIDS over the 2000-2010 decade under this assumption. Zambia and Kenya would lose 1.7 percent and 1.4 percent of their teachers each year respectively over the same period of time. In Uganda, AIDS mortality is lower. There, about 0.5 percent of teachers and education officers would die each year from AIDS over the 2000-2010 decade.

HIV/AIDS Affects Education Supply . . . Average Annual Percentage of Teachers Who Will Die from AIDS, 2000-2010



The HIV/AIDS epidemic will also affect the supply of educational services in Africa through increased absenteeism due to HIV/AIDS-related sicknesses. Though mortality represents the final outcome, it may well be that sicknesses resulting from HIV and AIDS take the higher toll over time.* HIV-infected teachers and other HIV-infected education officers and personnel will become increasingly unproductive and will need time off because of the opportunistic infections that invade the body with the breakdown of the immune system. In this analysis, each infected teacher and education officer is assumed to lose six months of professional time before developing full-blown AIDS and then 12 additional months after developing the full disease. Zimbabwe, suffering from the worst epidemic, would lose 3.2 percent of available teacher and education officer labor each year over the 2000-2010 decade to HIV/AIDS-driven morbidity. Zambia and Kenya would suffer annual losses of 2.5 percent and 2.1 percent in turn. HIV/AIDS morbidity would cost Uganda about 0.7 percent of its available teacher and education officer labor each year during the decade.

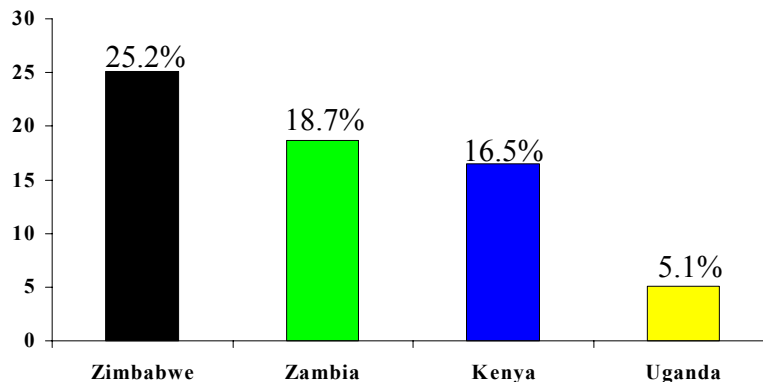
The HIV/AIDS epidemic will affect the demand for educational services moderately more than the supply through 2010. Since HIV/AIDS is affecting both the demand for educational services and the supply of those services, an important question is how the epidemic is affecting the overall demand-supply equation. Or are changes on one side of the equation simply canceling out changes on the other side? This is obviously a difficult question since much of the impact of the epidemic on both supply and demand is difficult to quantify. Two factors that can be reasonably quantified are teacher requirements under alternative population projections (demand) and AIDS deaths among teachers (supply). Fewer teachers are needed because the school age population is smaller; fewer teachers are available because of increased teacher mortality due to AIDS. The general pattern appears to be the same in all four countries. At least through 2010, the HIV/AIDS epidemic seems to have a moderately greater impact on the demand side. The change in the number of teachers needed is greater than the change in the availability of teachers.**

* At any moment in time, the HIV/AIDS epidemic will reduce the number of teachers available to teach by those teachers who are absent due to HIV-related illnesses and by those who have died from AIDS. In the following year, many of those teachers suffering from HIV-related illnesses will die and more recently infected teachers will be absent due to HIV-caused illnesses.

** The supply and demand analysis used throughout the paper is meant to be indicative and should be used cautiously. It only takes into account teacher mortality and teacher requirements based on size of the school age population. It does not, for example, consider other impacts of the epidemic on teacher supply, most notably absenteeism due to HIV-caused illnesses. Equally, it does not quantify other impacts of the epidemic on the demand for educational services, for example, the ability of HIV-affected households to pay for schooling.

The HIV/AIDS epidemic is affecting the potential clientele for educational services. The potential clientele includes all school age children. Most importantly, staggering numbers of children are being orphaned as a result of the epidemic. The graph shows maternal and double orphans as a result of AIDS in each of the study countries. By 2010, the proportion of all 0 to 14 year olds who would be maternal or double orphans as a result of AIDS would rise to more than 25 percent in Zimbabwe, to nearly 19 percent in Zambia, and to about 17 percent in Kenya. In Uganda, however, the proportion would be a much lower 5 percent in 2010. The addition of paternal orphans and orphans from causes other than AIDS would raise the totals in all the countries even further.

HIV/AIDS Affects the Clientele . . . Maternal and Double AIDS Orphans, 2010 (percent of 0 to 14 age group)



Current educational plans are mixed in their capability to recognize and incorporate the turbulence caused by HIV/AIDS into planning for the sector. In Zimbabwe and Zambia, educational planning systems are not recognizing and incorporating the turbulence caused by HIV/AIDS into planning for the sector. Zimbabwe has planned a major assessment of the impact of HIV/AIDS on the education sector in the near future so this situation will undoubtedly improve. In Kenya, though the strategic plan itself is not a highly quantitative document, the projections used in educational planning are reasonably effective in incorporating the impact of HIV/AIDS. In Uganda, though official projections also incorporate assumptions about HIV/AIDS, education sector planning projections in the ministry are based more on assumed intake and repetition rates than on projections of the size of the school age population and assumed enrollment ratios. This is because Uganda is trying to move from relatively low enrollment rates to universal primary education in a short period of time and so is taking large numbers of new students into the schools.

African countries need to take HIV/AIDS into account in educational planning to help ensure that scarce resources are used as effectively as possible. Effective planning is needed at any time, although the HIV/AIDS epidemic may intensify the need. The high prevalence countries are going to witness massive death and social disruption over the next decade and beyond as the full brunt of the HIV/AIDS epidemic takes effect. A strong education sector can help countries survive the intense social strains that will accompany rising death rates and declining life expectancies.

The education sector can be used effectively for HIV/AIDS prevention and mitigation. In all cases, educational ministries are eager to develop and expand sectoral programs for HIV/AIDS prevention and mitigation. While Kenya may be somewhat more advanced in this domain than the other countries, all four countries need resources, educational materials and technical assistance to aid their efforts. From a policy perspective, the needs are more in the areas of planning and resource mobilization than policy dialogue. Ministry officials tend to understand the importance of the sector and are committed to HIV/AIDS program expansion.

HIV/AIDS is wiping out the development gains of a generation; the high prevalence countries simply cannot expect to gain any development momentum until the epidemic is brought under control. At the same time, African countries still lack the broad education base necessary to create modern states. The education sector can be used to help bring the epidemic under control and to mitigate increasing social disruption. In turn, a reduction in HIV prevalence will eventually help limit much turbulence and loss in the sector itself.

II. INTRODUCTION

Background

The HIV/AIDS epidemic has become a development crisis in many countries of sub-Saharan Africa. The Joint United Nations Programme on AIDS (UNAIDS) estimated the number of HIV-infected persons worldwide at about 33.6 million at the end of 1999. About 23.3 million infected people – 70 percent of the total – were in sub-Saharan Africa. In 1999 alone, 5.6 million people became newly infected with HIV, 3.8 million of whom live in sub-Saharan Africa. Another 16.3 million persons have already died from the disease since the beginning of the epidemic, mostly in Africa. In 1999, about 570,000 children became newly infected with HIV, nearly all of whom were infants born to HIV-infected mothers. Nine of 10 newly infected infants were in sub-Saharan Africa.

Within Africa, the seriousness of the epidemic varies among countries. The UNAIDS-recommended measure to understand the extent of HIV in a population is HIV prevalence among 15 to 49 year olds, or the percentage of 15 to 49 year olds who are infected with the virus. The highest prevalence levels are found in a belt of countries in eastern and southern Africa. In Zimbabwe, for example, HIV prevalence among 15 to 49 year olds may be close to 25 percent. In Botswana, HIV prevalence may be even higher.

HIV/AIDS is not just one more problem among many. This is an emergency epidemic – a development crisis – that is ravaging the region and undermining all social and economic development efforts. A radical response that mobilizes all sectors, including the education sector, is imperative.

Both African and donor community officials have shown an ever-increasing interest in exploring the social and economic impacts of HIV/AIDS. The motivation has been twofold. First, HIV/AIDS program managers have worked on the premise that, as political and other leadership groups become increasingly aware of the devastating impacts of the epidemic, they will commit more resources to effective efforts to stem the spread of the virus. And second, prevalence rates are already so high that increasing mortality from AIDS is going to have a profound impact on the social and economic sectors regardless of what happens in the future. Accordingly, sectoral planning needs to take HIV/AIDS into account.

Education is one sector that is being struck hard by the epidemic. The conceptual framework discussed below outlines several ways that HIV/AIDS is causing turbulence in the education sector. Turbulence is an appropriate term. While change will be profound, not all of the impacts of the epidemic on the education sector will be unambiguously negative. For example, the loss of teachers or the rapid increase in the number of orphaned children will clearly be negative impacts. But the sector will also be smaller and growing more slowly than it would be in the absence of HIV/AIDS,

providing some opportunities to include a greater proportion of students in the system or to improve quality.

Objectives and Approach

Because of such turbulence, the HIV/AIDS epidemic raises important questions for educational planners. Is HIV/AIDS being taken into account in projections used for educational planning? If not, how much does it matter? What are the differences in the projections when HIV/AIDS is taken into consideration? The objective of this working paper is to help answer some of these questions by looking at projections used by educational planners in four African countries where HIV prevalence has been high – Zambia, Kenya, Zimbabwe and Uganda.

The interaction between the HIV/AIDS epidemic and the education sector is important and has been and will continue to be the subject of much discussion. The objective of the working paper is to contribute to this discussion by looking at a limited but important topic. This paper considers the demographic impact of the HIV/AIDS epidemic on the education sector in four African countries and whether education ministries are picking up this demographic impact in their planning for the sector. It also asks whether countries are using the education system for HIV prevention and mitigation.

To evaluate the impact of the HIV/AIDS epidemic on the education sector in a country, it is necessary to have a sense of the magnitude of the epidemic, its historical development and likely future course. Not unexpectedly, and despite the extreme gravity of the epidemic, much of the data on HIV/AIDS in sub-Saharan Africa is partial and fragmentary and subject to interpretation and best judgment.

Most African countries have official or accepted population projections and strategic plans for the education sector. The assumptions behind these projections can be examined to determine whether they incorporate information about HIV/AIDS. Beyond the written documents, statisticians and planners provide expert testimony on the development and content of different projections.

This working paper also relies heavily on applications of the AIDS Impact Model (AIM)*, a microcomputer-based projection model, as the basis for its quantitative analysis. With AIM, it is possible to prepare alternative projections using different assumptions about HIV/AIDS in a country. The projections can be used to look at impacts of the epidemic on the sector. The results from the AIM applications can also be compared with projections being used in the country to help determine whether HIV/AIDS has been taken into consideration.

To understand how HIV/AIDS is affecting the education sector, this working paper uses at least two projections for each country. In each case, the first is a hypothetical

* AIM is a microcomputer-based projection model that is part of the larger SPECTRUM suite of reproductive health policy models developed by The Futures Group International.

projection that assumes HIV/AIDS never existed in the country. In the discussion below, each of these will be designated the “Without AIDS” projection, for example, Kenya-Without AIDS.

The second projection for each country traces the historical development of the epidemic as closely as possible and then projects onwards to 2010. Each of these will be referenced as the “With AIDS” projection, for example, Kenya-With AIDS. These projections are designed to portray what is actually happening in the countries. The year 2010 is used as the end point of the projection because few education projections in the region go beyond that time and because assumptions about the course of the HIV/AIDS epidemic become increasingly problematic over longer periods of time.

AIM uses a standard cohort-component projection methodology. The initial fertility and non-AIDS mortality assumptions are kept the same for each country set of “Without AIDS” and “With AIDS” projections. What differs is inclusion of assumptions about HIV/AIDS in the “With AIDS” projections, including assumptions about the depressant effect of HIV on fertility. This approach makes it possible to identify the impact of the epidemic.

How does the HIV/AIDS epidemic affect the size and growth of the school age population? First, and most significantly, HIV/AIDS results in high death rates among reproductive age adults. The result is that there are many fewer births in a year because of the epidemic. As children born in a given year grow older and reach school age, there are fewer of them than would have been the case without AIDS. Second, about one-third of HIV-infected mothers transmit the virus to their babies during pregnancy or childbirth or while breastfeeding. Virtually all of these children die within a few years and never reach school age. This also reduces the potential size of the school age population.*

This comparison of “Without AIDS” and “With AIDS” scenarios is the best way to describe what is different about the education sector because of HIV/AIDS. However, this approach does not show the impact on the current sector of strengthening current efforts to combat the epidemic. To do this analysis would require a different approach and a longer time scale. This is because new HIV infections averted by improving prevention programs today would not result in a significant change in the projected number of school age children for at least 10 years. Though 2010 is chosen as the end point for this discussion, much of the impact of current and forthcoming prevention efforts will not be evident until later.

* At least some possibility exists that affordable drugs can be used to reduce mother-to-child transmission (MTCT) of HIV significantly. But even if MTCT could be reduced to much lower levels than exist today, the simulation models show that the impact on the future size of the school age population would be minimal during the time period of this study. The much more important factor is the reduction in the overall number of births due to high AIDS mortality among women in their reproductive years.

Conceptual Framework

To organize the findings, this working paper borrows from a conceptual framework developed by Professor Michael Kelly from the University of Zambia who has been an important contributor to thought about the interaction between the HIV/AIDS epidemic and the education sector. Kelly argues that HIV/AIDS affects the education sector in 10 broad ways.* The epidemic influences (1) the demand for education; (2) the supply of education; (3) the availability of resources for education; (4) the potential clientele for education; (5) the process of education; (6) the content of education; (7) the role of education; (8) the organization of schools; (9) the planning and management of the education system; and (10) donor support for education.

For presentation of the current study, these factors are reordered and limited to the following five issues.

- Educational planning;
- Demand for educational services;
- Supply of educational services;
- Potential clientele for educational services; and
- Content of education, expressed in terms of use of the sector for HIV/AIDS prevention and mitigation.

First, HIV/AIDS will affect educational planning in many ways, including the loss of planning and administrative personnel. New knowledge and skills will be required both to understand the impact of the epidemic on the sector and to formulate appropriate responses. As noted above, a primary focus of this working paper is to explore whether HIV/AIDS is being taken into account in educational planning systems in the study countries. Each country case below will examine this particular question.

Second, HIV/AIDS can have a serious impact on the demand for education. Most importantly, the staggering loss of life from HIV/AIDS means that the population – including the school age population – will be growing much more slowly than would be the case in the absence of HIV/AIDS. Because this is a demographic analysis, the size of the primary school age population will be the main indicator of demand used in the study. Of course, many other non-demographic enrollment issues affect the demand for schooling throughout sub-Saharan Africa.

In addition to reduced size, fewer children will be able to afford education and complete their schooling. Studies consistently show that AIDS-affected households have fewer resources available for schooling than unaffected households. Because HIV/AIDS sickness and death result in the loss of household labor and income, children are often required to leave school and go to work to make up for lost income. Others are forced by

* For more detail, see M.J. Kelly. *What HIV/AIDS Can Do to Education and What Education Can Do to HIV/AIDS*. Paper for presentation to the All Sub-Saharan Africa Conference on Education for All-2000. Johannesburg, December 1999.

circumstance to remain home to avoid school fees and/or care for sick family members. For social and cultural reasons, girls are more apt to be asked to care for sick members of the family than are boys. Though the relative access to schooling in HIV/AIDS affected households is an issue of considerable import, it is not a demographically driven phenomenon and is not considered in this report. But in reality, the household impact of the epidemic is having a significant impact on the demand for educational services throughout the region.

Third, HIV/AIDS also affects the supply of educational services. Teachers, of course, constitute the largest proportion of educational sector employees, and they are used most often in this analysis as the proxy for educational supply. But large numbers of administrators and other education officers as well as support personnel are also needed to run the system. All types of personnel will be affected by the epidemic.

HIV results in a deterioration of the immune system making an infected person more susceptible to and unable to recover from the opportunistic infections that invade the body with the loss of immunity. As HIV-infected teachers and other educational officers increasingly suffer from opportunistic infections, they will be more frequently absent from their duties. Even when they are able to be physically present, the presence of opportunistic infections means that they cannot be as productive as otherwise would be the case. By the time that full-blown AIDS is present, it is unlikely that a teacher or education officer could attend to any of his/her responsibilities. And once full-blown AIDS is present, it is almost inevitable that the teacher or education officer will die in the near future. Overall, declining productivity, increased absenteeism and increased teacher and education officer mortality means that the supply of educational services in Zambia will be seriously affected because of HIV/AIDS.

Fourth, HIV/AIDS also affects the potential clientele for education. This clientele includes all school age children. The HIV/AIDS epidemic affects access to the schools, the academic performance for many of those children who do manage to gain entry to the schools, and the content of the curriculum.

Most importantly, staggering numbers of children are being orphaned as a result of the epidemic. Studies from Africa have consistently shown that orphans have less access to educational resources and opportunities than other children. A common coping strategy is for orphaned children to drop out of school to avoid school fees and to help compensate for lost family labor and income. Those orphans who are in school often lack the material and psychological support needed for academic success. In many cases, the curriculum will need to be revised to provide them the skills to help them survive economically and socially when they leave school. This report will consider changes in the number of orphans in the population as a result of AIDS.

Fifth, HIV/AIDS is also causing changes in the content of education, especially in terms of how the sector is being used for HIV/AIDS prevention and mitigation. For example, HIV/AIDS and life skills education need to be increasingly integrated throughout the curriculum to help young people avoid high-risk sexual behavior. Likewise, HIV/AIDS

needs to be emphasized in teacher training, including in-service courses. In many countries, vocational education may have to play a more prominent role earlier in the curriculum to help those who will have to leave school because they have been orphaned or because they have to provide care for infected family members or themselves.

III. COUNTRY CASE STUDIES

The following sections will look at the situation in each of the four study countries – Zambia, Kenya, Zimbabwe, and Uganda. Each case study considers (1) the status and course of the HIV/AIDS epidemic in the country; (2) whether educational planners are taking HIV/AIDS into account; (3) changes in the demand for educational services; (4) changes in the supply of educational services; (5) the net impact on the demand for and the supply of educational services; (6) changes in the potential clientele for the sector; and (7) use of the sector for HIV/AIDS prevention and mitigation.

Zambia

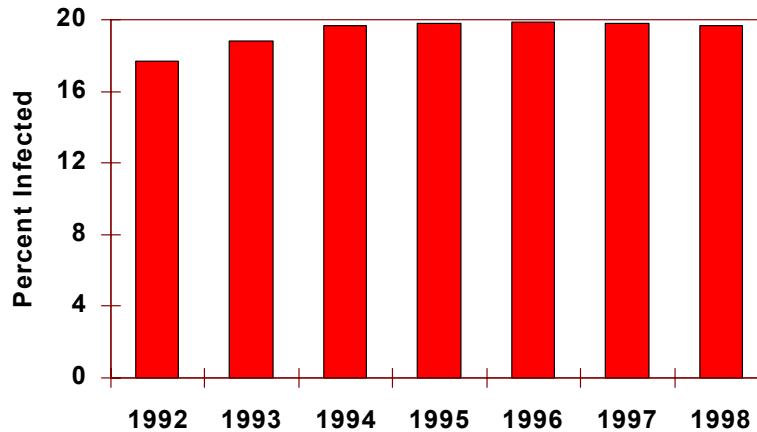
Status of the HIV/AIDS Epidemic in Zambia

HIV first appeared in Africa in the Great Lakes region in the late 1970s, and made its way southward to Zambia soon thereafter. HIV was probably already present in Zambia in the early 1980s. There, the virus found a receptive environment, as many of the factors that seem to contribute to a rapid expansion of HIV in a population existed in the country.

In this receptive environment, the epidemic exploded. The evidence indicates that HIV incidence was very high in the latter half of the 1980s and the early 1990s. Because of this early spike, HIV prevalence probably peaked around 1993 or 1994. Zambia now has two full rounds of sentinel surveillance, one in 1994 and one in 1998, as well as several population-based surveys. A recent analysis from the Central Board of Health based on this data estimates national prevalence at about 19.7 percent in 1994 and virtually the same in 1998* This suggests that HIV prevalence has probably been stable throughout most of the 1990s. Stability, of course, simply means that there is a balance between AIDS deaths and new infections; it does not necessarily suggest effective interventions or changing behavior.

* For the methodology used to estimate HIV prevalence in Zambia, see Ministry of Health/Central Board of Health. HIV/AIDS in Zambia: Background, Projections, Impacts, Interventions. Lusaka: Ministry of Health/Central Board of Health, 1999.

Zambia: Estimated HIV Prevalence, Ages 15 to 49, 1992-1998

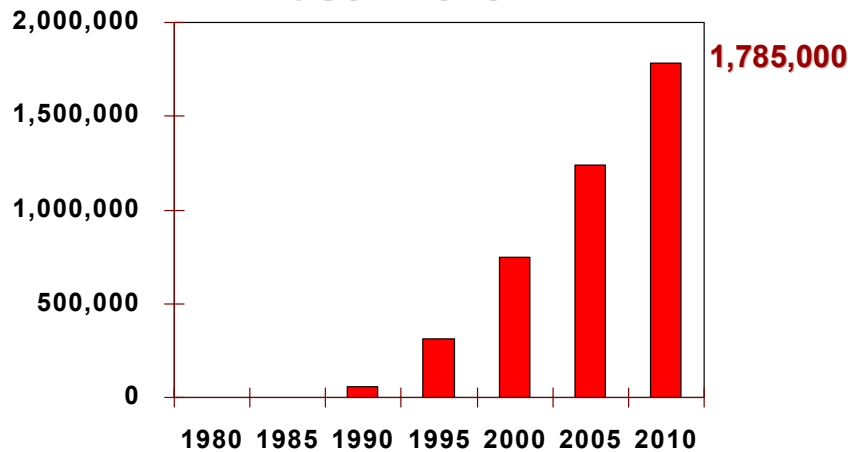


The Zam-With AIDS projection assumes that prevalence declines slowly between 1998 and 2010. Even in these circumstances the number of HIV-infected Zambians continues to rise because of the growth of the population. In 1998, there were probably about 982,000 HIV-infected persons in the Zambian population. By 2010, that number would rise to 1,209,000 despite the decline in prevalence.*

The stability of HIV prevalence at a high level throughout the 1990s is extremely important for the present discussion. Because of the lag between HIV infection and the development of full-blown AIDS and then death, it means that the worst impact of HIV/AIDS – including the impact on the education sector – will be felt during the first decade of the 21st century. This delayed effect can be seen in the graph on cumulative AIDS deaths. From the beginning of the epidemic until 2000, an estimated 745,000 persons died from AIDS in Zambia. But over the ensuing ten years, 2000-2010, the projections show that another 1,040,000 persons would die from the disease as the impact of the epidemic worsens.

* Unless otherwise indicated, the numbers quoted in this paper come from the AIDS Impact Model applications. For Zambia, HIV prevalence is assumed to peak at 19.7 percent in 1998 and then to decline slowly thereafter. Both the Zam-With AIDS and the Zam-Without AIDS projections use the same fertility and non-AIDS mortality assumptions to isolate the impact of the epidemic.

Zambia: Cumulative AIDS Deaths 1980 - 2010



HIV/AIDS and Educational Planning in Zambia

In Zambia, the primary education cycle is 7 years, inclusive of the 7 to 13 year old age group. For 1996, the reported gross enrollment ratio was 93 percent while the net enrollment rate was 69 percent. Neither has shown any improvement during the 1990s and actual enrollment rates may have declined moderately. By 1998, nearly 1.6 million children were enrolled in the primary schools of Zambia. About 52 percent of primary students were boys and 48 percent were girls. The Ministry of Education indicated that there were more than 35,000 primary teachers in 1998, 72 percent of whom were qualified. Males composed 52 percent of the primary teacher labor force and females constituted 48 percent.

Given the extreme magnitude and seriousness of HIV/AIDS in Zambia, does the evidence indicate that the Ministry of Education is incorporating assumptions about HIV/AIDS into its planning for the next decade? To help answer that question, it is possible to look at different projections.

Educating Our Future (1996) is the official strategic document for the sector. *Educating Our Future (EOF)* includes projections for the primary education sector. The projections do not use assumptions about HIV/AIDS in Zambia. But also, because of some probable technical errors in the calculations, the EOF projections seriously underestimate the future size of the school age population. These projections are simply not usable to understand or help plan for the sector. Planners in the Ministry of Education are aware of the limitations of the EOF projections and do not particularly rely on them.

BESSIP (Basic Education Sector Strategic Investment Programme) is the encompassing program for the development of the primary education sector over the next decade. All

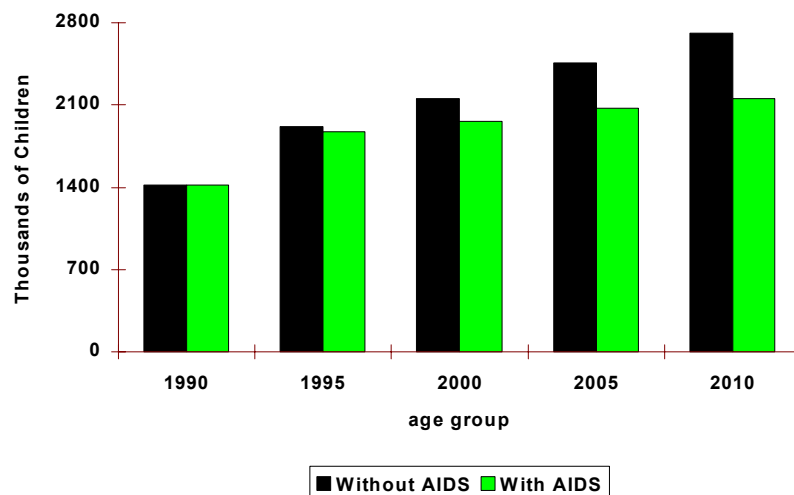
the donors supporting basic education in Zambia work through the BESSIP framework. Given the inadequacy of the EOF projections, the projections used in BESSIP project documents are about as close to official projections for the primary education sector as anything that exists in the country at the present time.

The BESSIP projections also do not use assumptions about HIV/AIDS and thus tend to overestimate the size of the primary school age population. This observation is verified by the fact that the projected size of the primary school age population in 2010 in the BESSIP projections is virtually identical to that in the Zam-Without AIDS projection.

Demand for Educational Services

HIV prevalence has been so high for so long in Zambia that the epidemic is having a clear impact on the demand for educational services. This can be seen by looking at the projected size of the primary school age population (7-13 year olds) over time.

Zambia: Primary School Age Children 1990-2010

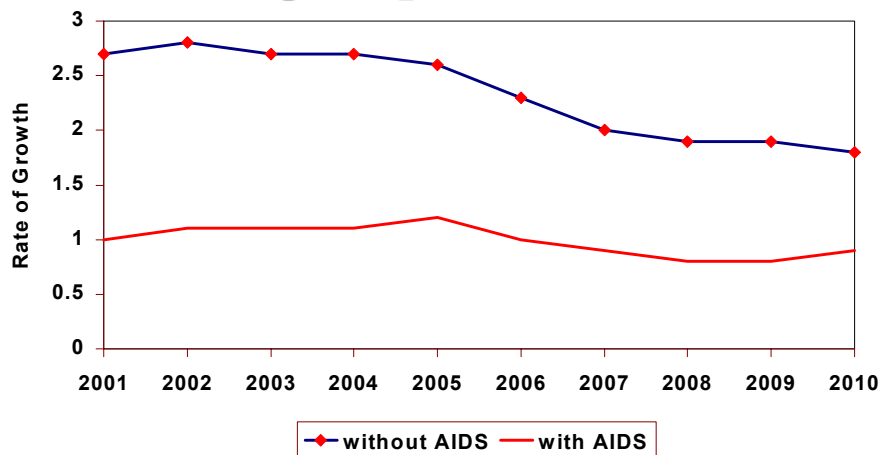


Under the Zam-Without AIDS projection, the size of the primary school age population rises to 2.71 million children by 2010. By contrast, under the Zam-With AIDS projection, the number of primary school age children is closer to 2.16 million, or more than 20 percent fewer children. The Zam-With AIDS projection of the number of primary school age children is also about 21 percent lower than the BESSIP projection.

The primary school sector is going to be a lot smaller by 2010 because of the HIV/AIDS epidemic than it would be otherwise, with all that implies for planning for the sector over the next decade. The sector will also be growing much more slowly than would be the case in the absence of HIV/AIDS. Because of past and projected declines in the fertility rate, the growth rate of the primary school age population would probably be dropping

over the 2000-2010 period even without AIDS. According to the Zam-Without AIDS projection, the growth rate for the primary school age population would drop from about 2.7 percent in 2000 to 1.8 percent in 2010. But under the Zam-With AIDS projection, the

Zambia: Growth Rate of Primary School Age Population, 2001 - 2010

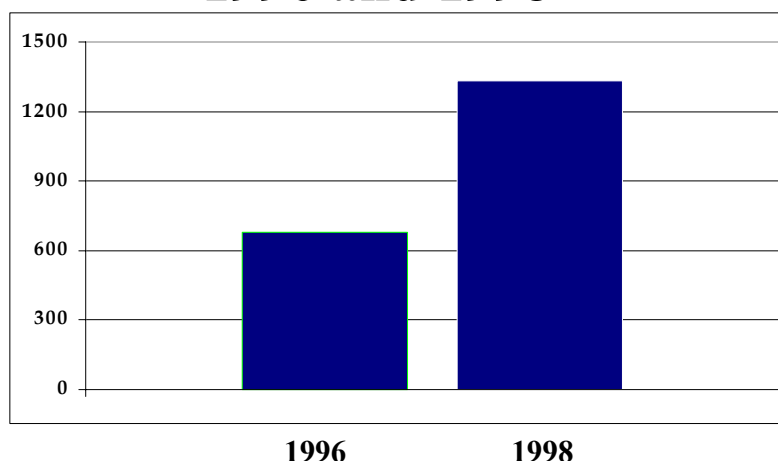


primary school age population would only be growing by 0.9 percent by 2010. By Zambian standards, this is a very low rate of growth. Forgetting all the other turbulence that HIV/AIDS is causing in the sector, the relatively slow expansion of the number of primary school age children may give Zambia an opportunity to close the gap between low enrollment rates and the national goal of universal primary education.

Supply of Educational Services

The HIV/AIDS epidemic is also affecting the supply of educational services in Zambia. The graph shows reported teacher deaths in Zambia for 1996 and 1998, and indicates a large increase in the number of teacher deaths from 680 in 1996 to 1,331 in 1998. This surge is not coincidental and almost certainly reflects the impact of HIV/AIDS. If 1,331 teachers died in 1998, then the death rate for teachers in that year was around 40 per 1000. By contrast, the death rate among all 15 to 49 year olds was about 23 per 1000. This would mean that teacher mortality was more than 70 percent higher than general adult mortality.

Zambia: Reported Teacher Deaths 1996 and 1998



It is tempting to conclude that teachers are even more prone to HIV infection than other adults in Zambia. But the difference is so great as to be suspect. If the death rate is 40 per 1000, then HIV prevalence has to be at least 34 percent among teachers and perhaps higher. While not impossible, this would be an exceptionally high prevalence rate, even by Zambian standards. In general, data collection in Zambia can be erratic and subject to wide variation from year to year for a number of reasons. If 1999 and 2000 data also indicate that teacher mortality is higher than general adult mortality, then conclusions could be drawn with more confidence. But the 1998 data is not conclusive empirical evidence in itself. At minimum, the Zambian situation shows how important it is for sectoral planning to track teacher mortality in an HIV/AIDS ravaged country.

In any case, nothing in the data suggests that teacher mortality from AIDS is lower than general adult mortality. About 1.7 percent of the 15 – 49 year old population will die from AIDS each year from 2000 to 2010.* Therefore, a cautious assertion would be that Zambia is likely to lose to AIDS at least 1.7 percent of its teacher force annually for many years into the future. Analyses suggest that there may be in the vicinity of 27,000 primary teachers available in Zambia in the early years of the 2000–2010 period. With

* A very close approximation of AIDS mortality in the 15 to 49 year old age group is calculated as follows. The 1998 crude death rate for the 15 to 49 year old age group is 23.2 in the Zam-With AIDS projection and 6.6 in the Zam-Without AIDS projection. The difference of 16.6 deaths per 1000 population, or 1.7 percent of the age group, can be attributed to AIDS. As a point of comparison, Boerma et al in a 1998 article make estimates of AIDS mortality versus general adult mortality based on empirical data from community studies in eastern Africa. When the Boerma findings are applied to Zambian data, the results are virtually identical to those from the AIDS Impact Model application. J. Ties Boerma, Andrew J. Nunn and James A.G. Whitworth. "Mortality Impact of the AIDS Epidemic: Evidence from Community Studies in Less Developed Countries," *AIDS* 12: Supplement 1 (1998), pp. S3-S14.

that many teachers, about 460 would die in a year from AIDS and be permanently lost to the system.

Though mortality represents the final outcome, it may be that morbidity resulting from AIDS takes the higher toll. Absenteeism is chronic in the Zambia system and there is no way to distinguish AIDS-driven absenteeism. However, some crude estimates can give a sense of the magnitude of the problem. It is improbable that once a teacher develops full-blown AIDS that he or she could contribute much professionally. Since, on average, it is about a year from the development of AIDS to death, a fair assumption is that each new AIDS case results in the loss of one year of professional time.

But the immune system can be breaking down for a long period of time, and the infected person can be beset by a series of illnesses long before diagnosis of full-blown AIDS. A conservative assumption might be that, on average, each infected teacher loses six months of professional time before developing full-blown AIDS and then 12 months thereafter. Based on this assumption, the country would lose about 2.5 percent of its available teacher labor each year to HIV/AIDS-driven morbidity* The loss would continue at about this same level through 2010. Given a primary teacher force of 27,000, Zambia would lose the equivalent of 670 teacher years of labor in a year because of HIV/AIDS related sicknesses. The losses would, of course, grow larger as the number of teachers in the system increases over the decade.

Impact on the Balance of Demand and Supply

Since HIV/AIDS is affecting both the demand for educational services and the supply of those services, is there any reasonable way to think about how the HIV/AIDS epidemic affects the balance of demand and supply? This is obviously a difficult question since much of the impact of the epidemic on both demand and supply is difficult to quantify. Two factors that can be reasonably quantified are primary teacher requirements under the alternative population projections and the number of AIDS deaths among teachers.

BESSIP has prepared a set of projections on teacher availability based on assumptions about teacher attrition, retention rates and output of new teachers from the teacher training colleges.** The BESSIP projections also show the number of primary students, based on projections of the size of the primary school age population and gross enrollment ratios. These projections use a GER of 1.01 in 2010 and indicate that primary enrollment would be 2,766,000 in that year. The Zam-Without AIDS projection shows a virtually identical enrollment of 2,737,300. Since the numbers are nearly the same, the discussion below will use the BESSIP assumptions but the Zam-Without AIDS projection to retain a consistency in the analysis. The projected number of required

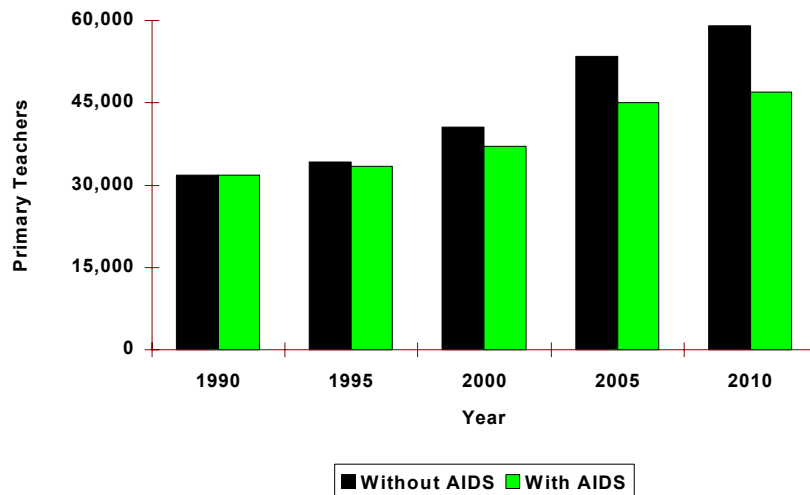
* The short calculation is as follows. If AIDS mortality is 1.66 percent of teachers, and if we assume that each AIDS death is associated with 1.5 years of disability (six months with HIV and one year with AIDS), then the total disability is 1.66 percent times 1.5 or 2.5 percent. A long calculation takes into account the fact that some disability is to persons who will actually die from AIDS in later years but yields a virtually identical result.

** World Bank. *Zambia: Basic Education Subsector Investment Program (BESSIP)*. Washington: The World Bank, 1999.

teachers can be compared with the projected number of available teachers using the BESSIP assumptions to determine the deficit (or surplus) of teachers.

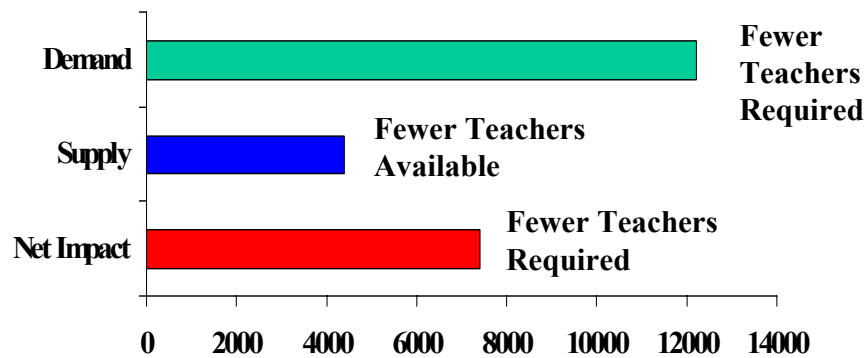
The next graph assumes a continuation of a primary student to teacher ratio of about 46. In these circumstances, the required number of primary teachers would rise to 59,600 in 2010 under the Zam-Without AIDS projection as opposed to 47,400 under the Zam-With AIDS projection. This is a difference of more than 20 percent, or 12,200 teachers. (When compared to the projections of teacher availability, there would be a shortfall of 16,100 teachers under the Zam-Without AIDS projection in 2010, but a lower deficit of 3,900 under the Zam-With AIDS projection.)

Zambia: Primary School Teachers Required, 1990 - 2010



But some of the difference between these two projections will be offset by the fact that the HIV/AIDS epidemic is affecting the supply of teachers as well as the demand for services. If supply and demand offset one another completely, the net effect of the HIV/AIDS epidemic should approach zero when teacher mortality is taken into account. In this case, as shown on the graph, the HIV/AIDS epidemic reduces the demand for primary teachers by 12,200 by 2010 but it reduces the supply of teachers by only 4,800. In the case of Zambia, the HIV/AIDS epidemic has a relatively greater impact on the demand for educational services than on the supply of those services up to 2010. In planning terms, Zambia could potentially use the turbulence of the epidemic to reduce some of the deficit of trained teachers in the country or to maintain lower student-teacher ratios.

Zambia: Impact of HIV/AIDS on Teacher Demand and Supply by 2010



Without repeating the entire discussion, the BESSIP projections include a second alternative whereby a series of policy measures allows Zambia to raise the primary student to teacher ratio to 60 over time. Looking at just teacher requirements, the Zam-Without AIDS projection shows a need for 45,600 teachers in 2010, while the Zam-With AIDS projection indicates a need for 36,300 teachers. These requirements can be compared with projected teacher availability. If teacher AIDS mortality parallels overall AIDS adult mortality, there would be a teacher surplus in 2010 under the Zam-With AIDS projection of 2,700 teachers. The combination of an increasing student-teacher ratio and the impact of the HIV/AIDS epidemic would ensure sufficient primary teachers.

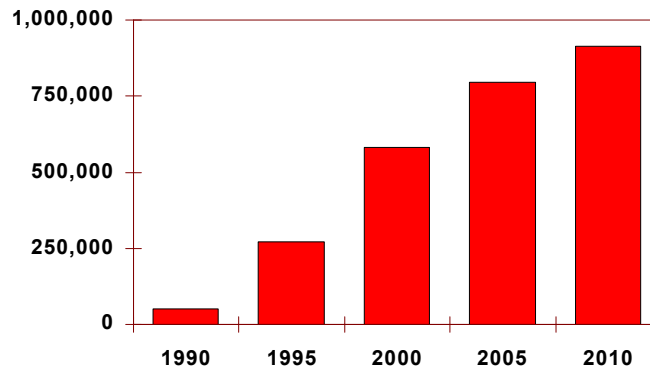
Potential Clientele for Educational Services

Another critical way that the HIV/AIDS epidemic affects the education sector is that it changes the potential clientele for educational services in Zambia. Of greatest important, HIV/AIDS is resulting in a great surge in the number of orphans in the Zambian population, and both the absolute number and the proportion of orphans in the population will continue to rise over the 2000-2010 decade.

Estimates of the number of orphans in Zambia vary quite considerably due to the difficulties in collecting data on orphans. Definitions vary also. In its estimates of the number of orphans as a result of AIDS, UNICEF defines an AIDS orphan as a child under the age of 15 who has lost either his/her mother (maternal orphan) or both parents (double orphan) to the epidemic. Paternal orphans (loss of the father only to AIDS) are excluded from the UNICEF definition because of measurement problems. The projections used in this study use the UNICEF definition.

The graph shows maternal and double orphans in Zambia as a result of AIDS. Under the

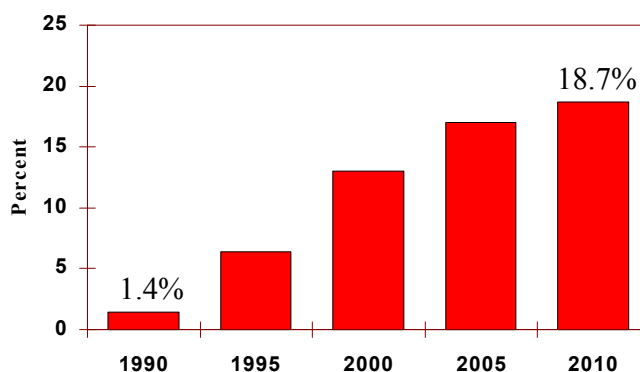
Zambia: Maternal and Double Orphans as a Result of AIDS, 1990-2010



Zam-With AIDS projection, the number of maternal and double orphans grows from 51,300 in 1990 to 581,300 in 2000. Because of high HIV prevalence throughout the 1990s, it is almost certain that the number of orphans will rise considerably over the 2000-2010 decade. In this study, the number of orphans as a result of AIDS rises to 914,800 by 2010. (Keep in mind that a child matures out of the orphan population when he or she reaches the age of 15. Therefore, the cumulative impact of HIV/AIDS on orphanage in Zambia is much greater than is picked up at any one point in time.)

The next graph shows the percentage of the 0 to 14 age group who are maternal or double

Zambia: Maternal and Double AIDS Orphans as Percentage of 0 to 14 Age Group, 1990-2010



orphans as a result of AIDS. By 2010, 19 percent of the age group will have lost either the mother or both parents to the epidemic. If maternal and double orphans from other causes are added to the total, the projections show that more than one out of every four children would be without a mother or both parents by the last year of the projection. And if paternal orphans* are also included, it is probable that, at minimum, more than 30 percent of all children of school age will have lost at least one parent, up dramatically from 1990. Overall, HIV/AIDS is likely to increase the orphan burden in Zambia to about 4 times what it might have been in the absence of the epidemic. Beyond doubt, the HIV/AIDS epidemic is having a tremendous impact on the potential clientele for educational services in Zambia.

Use of the Sector for HIV/AIDS Prevention and Mitigation

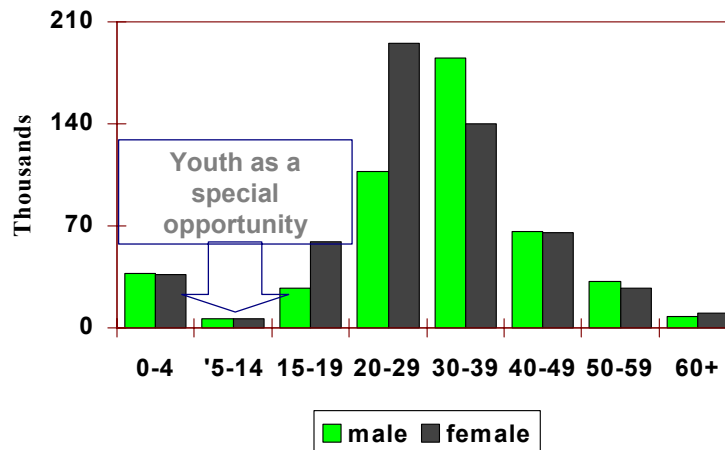
The HIV/AIDS epidemic is also affecting the content of education in Zambia. An urgent need exists to continue to incorporate HIV/AIDS education into the curriculum at all levels so that students are increasingly aware of how HIV is spread, the fatal consequences of the disease, and ways to prevent infection. There is also increasing concern with life-skills education that helps students learn how and why to avoid high-risk sexual behavior and how to cope with social or peer pressure that encourages risky behavior. And many children, because of the epidemic, will never complete their schooling. Many will have to depart to care for sick family members or to replace lost

* Measuring paternal orphanage in Africa is difficult. Because of technical issues, UNICEF and others use maternal and double orphans as the standard measure. Social surveys in eastern and southern Africa that include questions on orphan status often show high rates of paternal orphanage. However, some critics believe the results are often inflated by inclusion of fathers who are not in the household because of abandonment or absenteeism rather than death. Estimates of paternal orphanage should therefore be used cautiously.

family income. Others will be orphaned and will have to leave school to care for themselves and others. Increasingly, the Zambian school curriculum will be called upon to provide skills and training to help these young people survive on their own.

That the education sector may have a special role to play in a multisectoral response to the epidemic is clear from the following graph showing the age and sex distribution of HIV infections in Zambia in 1999. The level of HIV infection is very low among 5 to 14

Zambia: Age and Sex Distribution of Estimated HIV Infections, 1999



year olds, the main school age population in Zambia. The level of infection is much higher among 15 to 19 year olds and higher still among 20 to 39 year olds. Presumably, if the current school age population can be taught the risks of HIV and ways to prevent infection, then the upcoming generation need not repeat the HIV experience of the present generation. Though not the subject of this paper, a continued discussion of great import in Zambia and elsewhere will be what are the most effective strategies that can be adopted and/or enhanced to teach students about HIV/AIDS.

The education sector is ready to increase its role in combating HIV/AIDS in Zambia. The Ministry of Education has issued two excellent policy statements on the education sector and HIV/AIDS prevention and mitigation. One is found in *Educating Our Future* (1996) and the other can be located in the recently released *BESSIP Statement on HIV/AIDS* (1999). (Though, it should also be noted, BESSIP was slow in incorporating HIV/AIDS into its overall program.)

For the most part, the *BESSIP Statement on HIV/AIDS* is clear and exemplary. It calls for HIV/AIDS to be integrated in all subject areas throughout the curriculum. It also calls for increased co-curricular activities – anti-AIDS clubs, for example – and intensified peer

counseling in all schools. The *BESSIP Statement* also notes the need for comprehensive HIV/AIDS training programs for teachers and other education officers, both as part of their professional preparation and subsequent in-service training. The document recognizes the need for teacher support, both to help teachers deal with those around them who are infected or otherwise affected by the epidemic and to help those teachers who are themselves infected to live positively. It similarly calls for pupil support, including ways to help orphans and other vulnerable children. Finally, the *BESSIP Statement* witnesses the need for special information, education and communication (IEC) and research programs within the education sector to help address the HIV/AIDS development crisis in Zambia.

Although the Ministry of Education in Zambia is not yet doing an adequate job incorporating HIV/AIDS into educational planning for the country, ministry officials nevertheless recognize that the education sector has a crucial role to play in addressing the HIV/AIDS epidemic in Zambia. From the perspective of intensifying the response to HIV/AIDS in Zambia, the recognition and motivation to use the education sector are, to a large extent, already in place. Now pilot programs need to be scaled-up to national level in this geographically large and decentralized country. This means the key questions revolve around issues of planning, resource mobilization and program implementation. To use the sector as effectively as possible to combat HIV/AIDS, Zambia needs resources, materials and technical assistance.

Certainly much can be done – and needs to be done – to improve educational planning by considering more carefully the turbulence that the epidemic is bringing to the sector. But this needs to be done to bring educational plans more into alignment with the demographic realities of the country. This will help to ensure that scarce resources are used wisely and effectively. Sectoral assessments are needed less to motivate officials to use the sector to respond to the epidemic.

Kenya

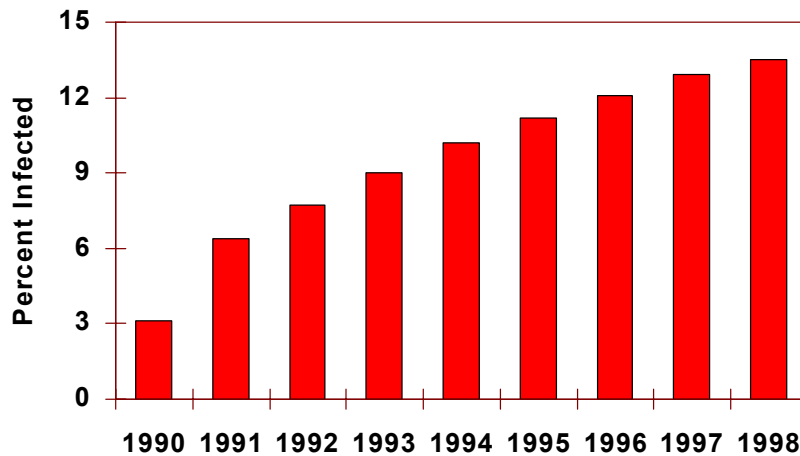
Status of the HIV/AIDS Epidemic in Kenya

In Kenya, the National AIDS/STDs Control Programme (NASCO) estimates prevalence in 1998 at approximately 13.5 percent. While this is a horrific rate of infection, it is nonetheless lower than that found in Zambia or Zimbabwe and some of the other countries of southern Africa.

The development of the epidemic in Kenya is noteworthy. Estimates derived from the sentinel surveillance system suggest that HIV prevalence was still relatively low in 1990 compared to what was happening in other countries in the region.* Unfortunately, one of the characteristics of the HIV/AIDS pandemic is that once HIV is rooted in a population, prevalence can rise very quickly. This appears to be what happened in Kenya. The graph shows that HIV prevalence has climbed steadily upwards throughout the 1990s. From an

* See, for example, National AIDS and STDs Control Programme. “Estimating National HIV Prevalence in Kenya from Sentinel Surveillance Data.” Unpublished paper, 1999.

Kenya: Estimated HIV Prevalence 1990 - 1998

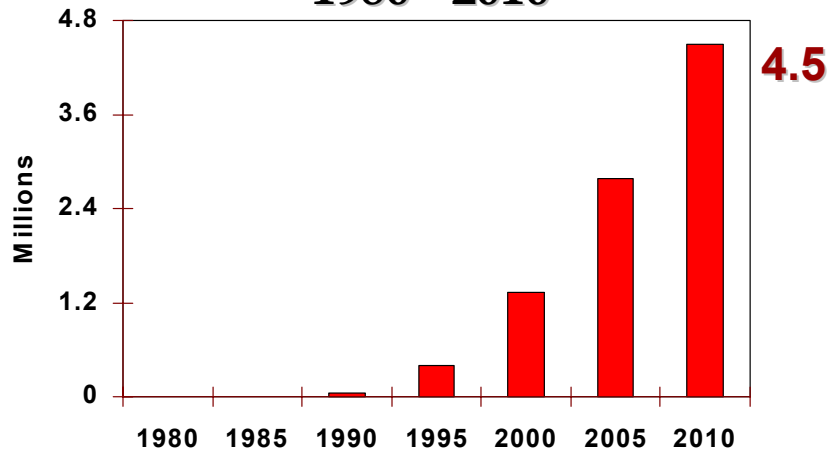


estimated 3 percent in 1990, HIV prevalence rose to 13.5 percent in 1998. No one knows how much further prevalence will rise. For purposes of this analysis, HIV prevalence is assumed to increase for a few more years, reaching 15 percent in 2003 and then remain steady near that level until 2010.

The other key assumption in the projections is that the fertility rate continues its historic decline and reaches a 3-child per woman average in 2010. This is consistent with projections prepared by the Central Bureau of Statistics that are used by the Ministry of Education, Science and Technology.

The fact that HIV prevalence has been rising steadily throughout the 1990s is of considerable importance. It means that the most serious epidemiological, social and economic impacts of the epidemic in Kenya are yet to come. These will be felt over the 2000-2010 decade and beyond. The graph on cumulative AIDS deaths illustrates this point well. Based on the assumptions in the current analysis, cumulative AIDS deaths

Kenya: Cumulative AIDS Deaths 1980 - 2010



from the beginning of the epidemic until 2000 probably totaled about 1.3 million. But between 2000 and 2010, another 3.2 million Kenyans may die, for a cumulative total of 4.5 million. This is enormous mortality for a mid-sized country and illustrates that the full brunt of the HIV/AIDS epidemic resides in the future.

HIV/AIDS and Educational Planning in Kenya

In Kenya, the primary education cycle is 8 years from ages 6 through 13. In actuality, large numbers of children outside this age group are enrolled in the system. About 5.9 million primary students were enrolled in the public system in 1998, or a gross enrollment ratio of about 89 percent. While Kenya has achieved virtual gender parity in primary school enrollments, regional disparities continue. For example, the gross enrollment ratio in Northeastern Province in 1998 was only 25 percent. Kenya had more than 192,000 primary teachers in 1998, for a student-teacher ratio of 31:1. Of these, about 97 percent were trained teachers. About 58 percent of primary teachers in 1998 were males while 42 percent were females.

Given that the worst impact of the HIV/AIDS epidemic is yet to come, an important question in the present context is whether educational planners in Kenya are thinking about HIV/AIDS in planning for the sector over the next decade. The guiding strategic document for all levels of the education sector is the *Master Plan on Education and Training* (MPET), printed in September 1998. Much of this strategic plan is qualitative in its goals and objectives, although there is some use of quantitative information. Most importantly for present purposes, MPET utilizes projections of the primary school age population and the secondary school age population between 1997 and 2010 as the basis for sectoral planning.

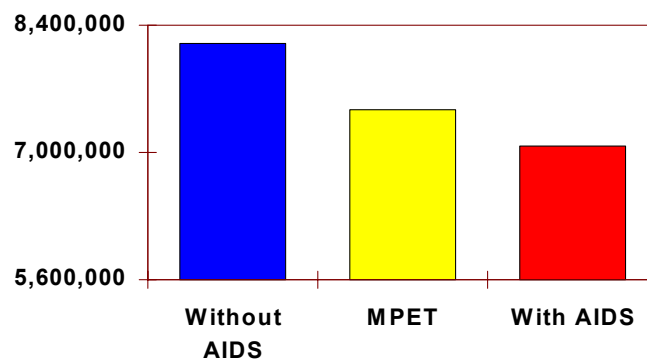
There are two ways to find out whether the MPET projections are incorporating assumptions about HIV/AIDS. The first is to revisit the assumptions behind the projections to see how they were constructed. The second is to compare the MPET projections with those prepared using the AIDS Impact Model.

The MPET projections are taken from a set of population projections prepared by the Central Bureau of Statistics (CBS) and published in April 1996. This means that the projections were most likely done in 1995, if not earlier. The MPET/CBS projections clearly take HIV/AIDS into account. The projections assume that the epidemic in Kenya started in the late 1970s and that prevalence rose to 3.6 percent in 1990. The projections then assume that HIV prevalence rises steadily to 9.0 percent by 2005 and remains at that level through 2010. At the time of writing (circa 1995), the authors openly acknowledged that the future of the HIV/AIDS epidemic was a great uncertainty and that actual trends could vary widely from the projections.

HIV prevalence rose more quickly and to a higher level (13.5 percent by 1998) than anticipated in the MPET/CBS projections. If the MPET/CBS projections take into account HIV/AIDS but underestimate the actual historical rise in prevalence, then it would be expected that the results of the MPET/CBS projections would lie somewhere between the Kenya-Without AIDS and the Kenya-With AIDS projections.

This turns out to be the case. By 2010, the MPET projection of the primary school age population is about 10 percent lower than the number under the Kenya-Without AIDS projection, but about 6 percent greater than the Kenya-With AIDS projected number of school age children. MPET is picking up some of the impact of HIV/AIDS on the education sector but not all of it. The difference is relatively small, however, and does not seriously distort the MPET vision of the sector over the next decade.

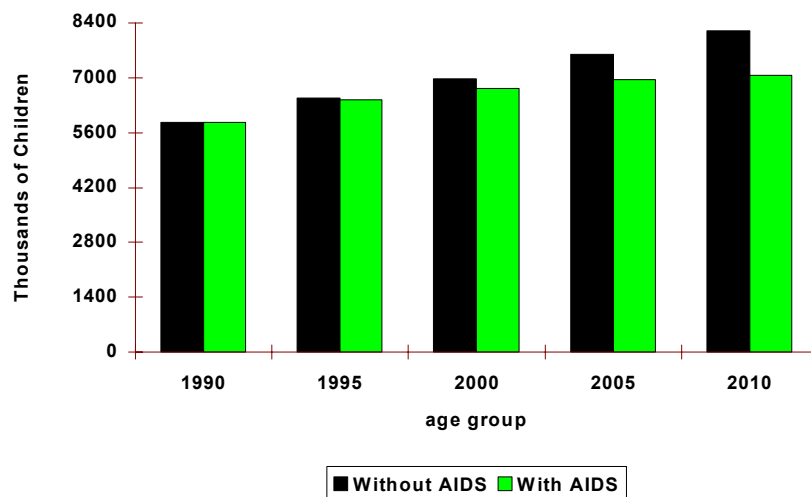
Kenya: Primary School Age Population, 2010



Demand for Educational Services

The HIV/AIDS epidemic is clearly affecting the demand for educational services in Kenya. Since Kenya has a goal of universal primary education, the impact can be seen in comparisons of the projected primary school age population. In the Kenya-Without AIDS projection, the primary school age population (6 to 13 year olds) rises to 8.2 million children by 2010. In the Kenya – With AIDS projection, the number of primary children increases to 7.1 million children by 2010, a difference of about 14 percent.

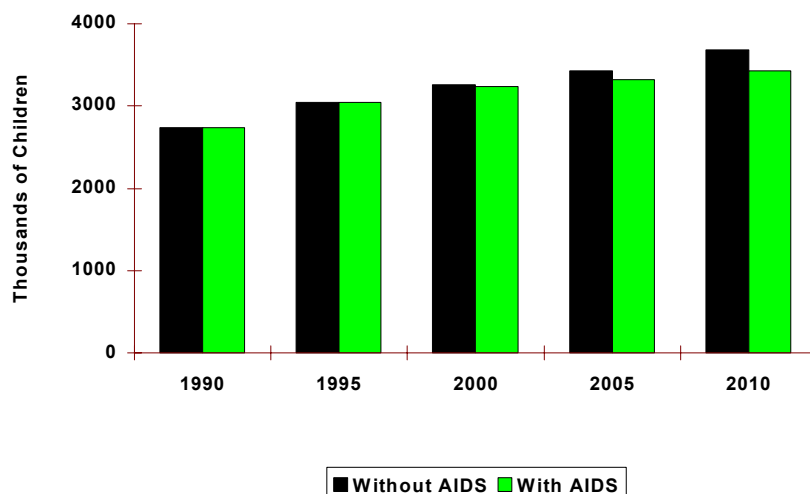
Kenya: Primary School Age Children 1990 - 2010



Between 2000 and 2010, the primary school age population would grow by about 18 percent under the Kenya-Without AIDS projection. However, under the Kenya-With AIDS projection, the primary school age population would only increase by about 5 percent over the 2000-2010 decade, very close to a no growth situation. In fact, by the end of the decade, the number of primary aged children would not be increasing at all. The combination of declining fertility and HIV/AIDS has created a situation in Kenya where the country can make gains in the education sector – if it can adjust to some of the other HIV/AIDS-driven turbulence – without having to keep up with a rapidly growing school age population.

Ministry of Education, Science and Technology officials wanted the study expanded to include similar projections for secondary school age children (14 to 17 year olds). As shown on the graph, Kenya would have 3.69 million children of secondary school age under the Kenya-Without AIDS projection by 2010 versus 3.43 million under the Kenya-

Kenya: Secondary School Age Children 1990 -2010



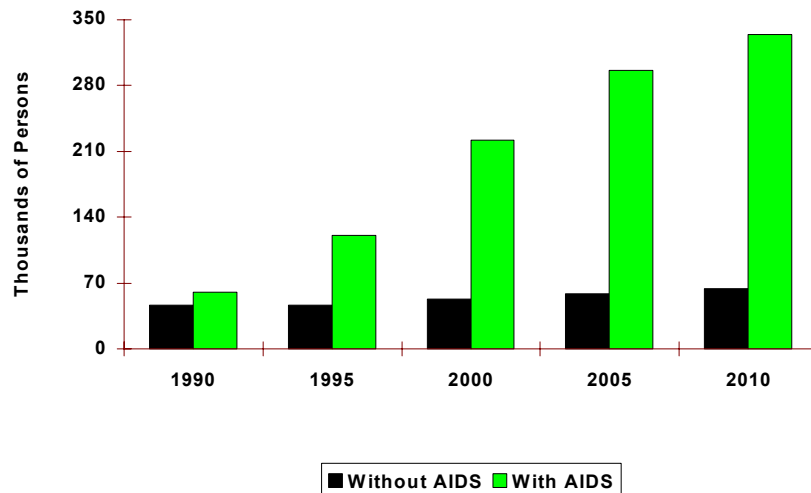
With AIDS projection. This is a difference of about 7 percent, a much smaller differential than for primary school age children.

Does this mean that the HIV/AIDS epidemic will not have as much impact on secondary education as on primary education? In actuality, the epidemic will have just as much impact at secondary as at primary level, but much of the impact will come after 2010. The real lesson is that the effects of HIV/AIDS on social development are going to last for a long time even if prevalence starts to decline quickly in Kenya.

Supply of Educational Services

The HIV/AIDS epidemic is also affecting the supply of educational services in Kenya. Because HIV infection is heavily concentrated among 15 to 39 year olds, death rates in the 15 to 49 year old age group can be expected to rise dramatically as the epidemic unfolds over time. The graph shows that the number of deaths in the 15 to 49 year old age group in 2000 in the Kenya-With AIDS projection is more than 3 times greater than in the Kenya-Without AIDS projection. By 2010, the difference is more than 4 times as

Kenya: Annual Deaths to Persons Ages 15 to 49: 1990 -2010

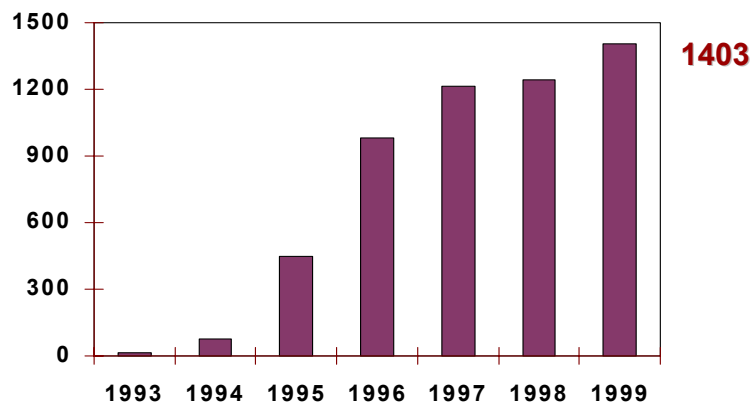


much. And because the population is larger in the Kenya-Without AIDS projection than it is in the Kenya-With AIDS projection, even this graph understates the enormous impact the HIV/AIDS epidemic is having on mortality in the working age groups in Kenya.

These are probably conservative estimates, and mortality as a result of the AIDS epidemic may be even higher because the epidemic will likely have a secondary effect as well as an immediate impact on death rates. For example, the presence of an HIV/AIDS epidemic in eastern and southern Africa is invariably accompanied by a great rise in tuberculosis (TB) cases. Since TB can be spread by contact, those who have developed TB because of the HIV-caused breakdown of the immune system will communicate TB to others who are not HIV-infected, raising mortality even further.

Given the projected trends, a rapid rise in teacher deaths over time should be expected. This appears to be what is actually taking place. The Teachers Service Commission provided data on reported teacher deaths. The graph shows annual teacher deaths rising from 450 in 1995 to more than 1,400 in 1999. Teachers Service Commission officials report that the annual number of deaths is already about the same as the annual number of retirements and is becoming an increasing burden on the system. Although deaths cannot be identified by cause, no one doubts that HIV/AIDS is the major contributor to this upward trend. Since the worst effect of the epidemic is yet to come, the annual number of teacher deaths is expected to continue to rise.

Kenya: Reported Teacher Deaths 1993 - 1999



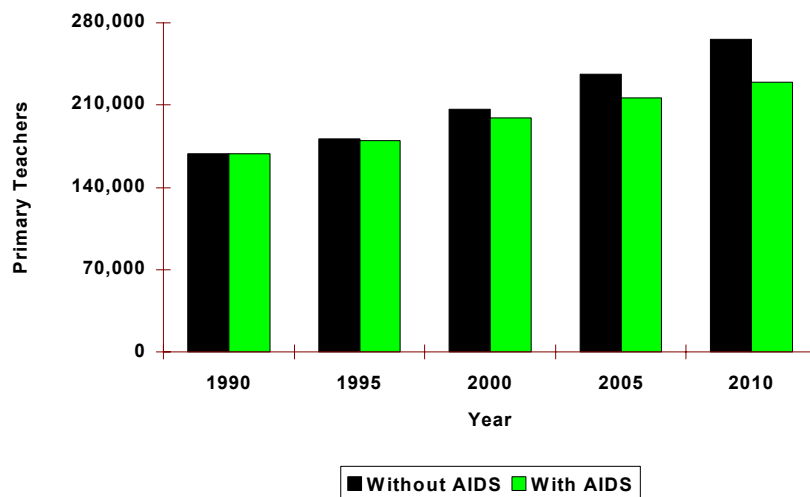
The information on reported teacher deaths does not imply that teacher mortality is higher than that of the general adult population, but the overall rise in working age mortality is sufficient to affect the supply of educational services. Assuming that AIDS mortality among teachers is the same as among the general adult population, Kenya would be losing about 1.4 percent of its teacher force to AIDS mortality each year over the 2000-2010 period. But again, it may be HIV/AIDS morbidity that takes the higher toll. Using the assumption that HIV-infected teachers, on average, lose six months of professional time prior to development of full-blown AIDS and then 12 months of professional time thereafter, Kenya would lose about 2.1 percent of its available teacher labor each year over the 2000-2010 period.

Impact on the Balance of Demand and Supply

The HIV/AIDS epidemic is thus affecting both the demand for and the supply off educational services in Kenya. Primary school teachers are again used as the indicator to look at the balance between supply and demand.

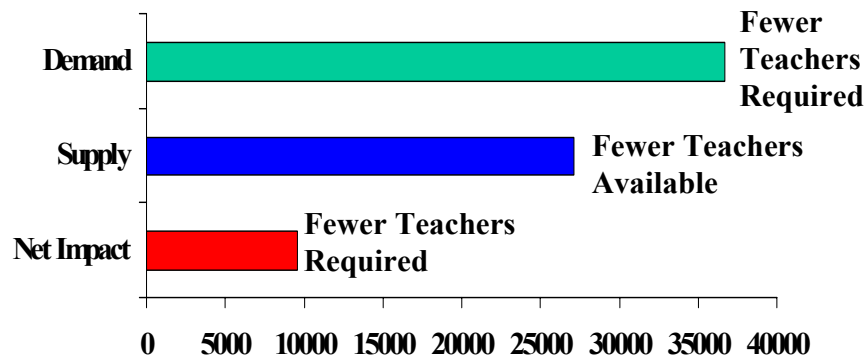
The graph below shows primary teacher requirements under the two population projections to isolate the impact of the epidemic on the demand for educational services. The projections assume a primary student-teacher ratio of about 31. Under the Kenya-Without AIDS projection, the required number of primary teachers would rise from 181,400 in 1995 to 236,000 in 2005 and 266,100 in 2010. Under the Kenya-With AIDS projection, the required number of teachers would reach 216,100 in 2005 and 229,400 in 2010. By 2010, the difference between the two projections would be 36,700 teachers or about 14 percent of the total required under the Kenya-Without AIDS projection.

Kenya: Primary School Teachers Required, 1990 - 2010



On the other side of the equation, a simulation exercise indicates that AIDS mortality would reduce the supply of primary teachers by an estimated 27,100 teachers over the same period of time. In the simulation, then, the HIV/AIDS epidemic reduces the demand for teachers by 36,700 but lessens the supply by 27,100. The net impact is a reduction of 9,600 required primary teachers, or about 4 percent of the required total. The change in supply offsets much of the change in demand in Kenya.

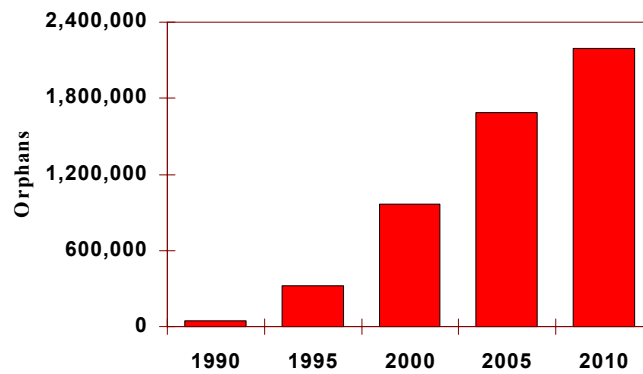
Kenya: Simulated Impact of HIV/AIDS on Teacher Demand and Supply by 2010



Potential Clientele for Educational Services

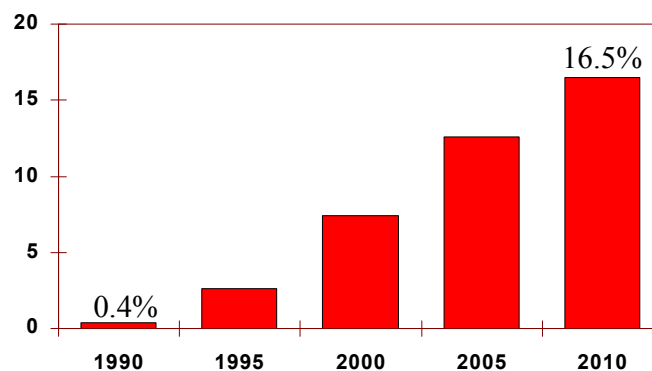
As with other countries in the region, the surging orphan population is changing the potential clientele for educational services in Kenya. The graph indicates that the number

Kenya: Maternal and Double Orphans as a Result of AIDS, 1990-2010



of maternal and double orphans as a result of AIDS rises from about 323,000 in 1995 to 2,200,000 in 2010. These would equal about 16.5 percent of all children under the age of

Kenya: Maternal and Double AIDS Orphans as Percentage of 0-14 Age Group, 1990-2010



15 in 2010. Orphans from causes other than AIDS and paternal orphans would have to be added to get a complete picture of the orphan situation. But in any case, it is the HIV/AIDS epidemic that is at the root of the expanding orphan crisis in Kenya and that is dramatically changing the potential clientele for educational services in the country.

Use of the Education Sector for HIV/AIDS Prevention and Mitigation

The Ministry of Education, Science and Technology and the National AIDS and STDs Control Programme (NASCO) are dedicated to using the education sector to combat HIV/AIDS in Kenya. The ministry launched a UNICEF-supported AIDS Education Project in 1992. The objectives of this project were to (1) strengthen the capabilities of the ministry to implement HIV/AIDS programs; (2) sensitize and train education sector personnel to organize and implement HIV/AIDS activities at provincial, district and school levels; (3) design and develop educational materials to assist teachers to carry out AIDS education and activities; and (4) institutionalize collaboration between the Ministry of Education, Science and Technology and other public and private sector organizations.

As was typical of early efforts, these were largely pilot programs. Under the current version of the AIDS Education Project, efforts are being made to expand the earlier programs to encompass all of Kenya. Both MoES&T and NASCO staff believe that the education sector is making rapid strides in scaling up programs to national level, particularly in the areas of materials development and distribution and teacher training. MoES&T, for example, recently completed an HIV/AIDS curriculum for primary and secondary schools that will be printed and distributed in the near future. The ministry is also expanding HIV/AIDS in-service training for teachers. From the MoES&T and NASCO viewpoint, the major challenge now is to continue to expand and strengthen programs to maximize the impact the education sector can have on changing the course of the HIV/AIDS epidemic in Kenya.

Zimbabwe

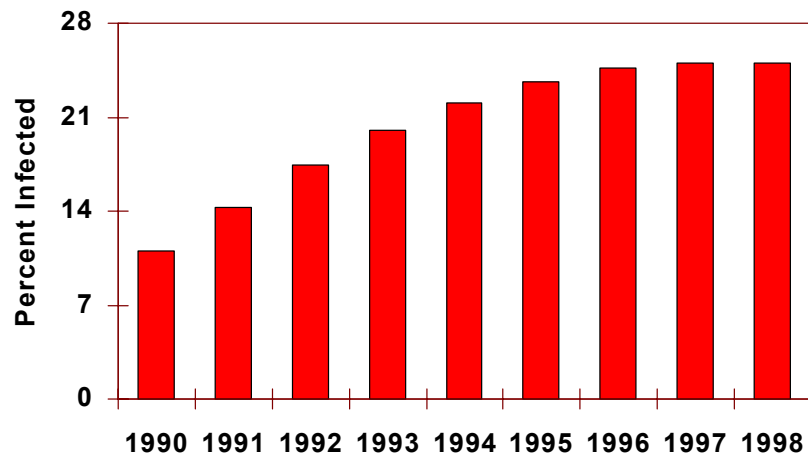
Status of the HIV/AIDS Epidemic in Zimbabwe

Although Zimbabwe may well be one of the one or two countries most affected by HIV/AIDS in the world, the HIV sentinel surveillance system has not functioned well enough to give a consistently clear picture of the epidemic. Only a few sites collected data in 1996. Although blood samples were gathered from nearly all sentinel sites in 1997, funding issues led to a long delay between collection and analysis in many cases. As a result, officers from the National AIDS Coordination Programme caution that many of the results may be unreliable. Hence, most estimates of HIV prevalence are based on sentinel surveillance data from 1994 and 1995. This is unfortunate in such a disastrously affected country.

The recently released *National HIV/AIDS Policy* estimates adult HIV prevalence at 25 percent. This is consistent with the 1994 and 1995 sentinel surveillance data and also with what information is available from the 1997 sentinel surveillance survey.

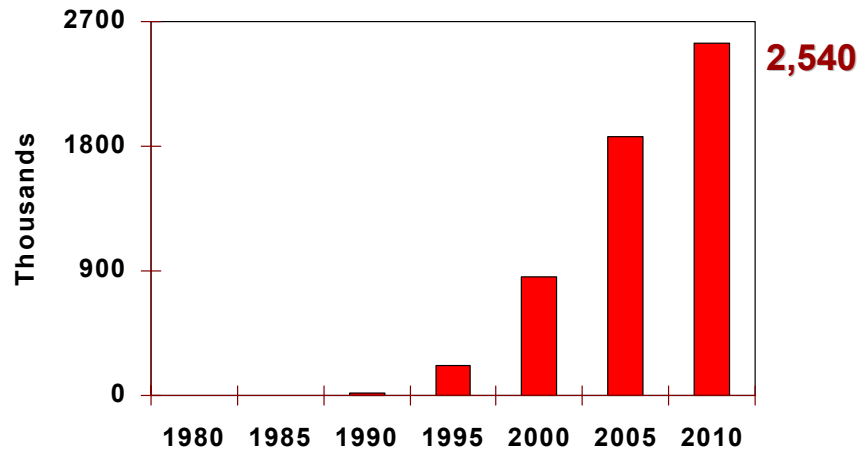
What evidence exists suggests a pattern similar to that in Zambia. HIV probably made its way into Zimbabwe sometime in the early 1980s. Conditions existed that facilitated a rapid spread of the virus within Zimbabwe. Incidence increased quickly and prevalence was already at high levels early in the 1990s. Prevalence may now be around 25 percent.

Zimbabwe: Estimated HIV Prevalence 1990 - 1998



Extremely high prevalence in combination with the lag between infection and eventual death means that much of the brunt of the HIV/AIDS epidemic on Zimbabwean society and development is going to be felt over the next decade and thereafter. Cumulative AIDS deaths since the beginning of the epidemic can again be used to illustrate this point.

Zimbabwe: Cumulative AIDS Deaths 1980 - 2010



According to the projections, by 2000 about 850,000 Zimbabweans would have died by 2000 since the beginning of the epidemic. Over the ensuing ten years, 2000-2010, almost 1.7 million additional persons would perish from the disease as Zimbabwe increasingly feels the impact of the epidemic.

HIV/AIDS and Educational Planning in Zimbabwe

In Zimbabwe, primary education consists of a 7-year cycle, designed to be inclusive of the 6 to 12 year age group. In practice, a large proportion of 6-year olds do not enroll until older ages. After independence, the Government of Zimbabwe rapidly expanded the education sector. Primary enrollments more than doubled from 1.24 million to 2.49 million primary students between 1980 and 1996. About the same number were enrolled in 1998. While Zimbabwe has not yet achieved universal primary education, enrollment ratios are high. In recent years, the gross enrollment ratio has been about 115 percent. Gender imbalance is not a particular problem in the primary schools of the country, as enrollment ratios for girls are virtually the same as those for boys.

The primary student-teacher ratio in recent years has been about 39:1. In 1998, there were about 64,500 primary teachers in Zimbabwe. More than 3 out of every 4 primary teachers are trained and the proportion of untrained teachers has been diminishing steadily over time. About 56 percent of primary teachers are male and 44 percent are female.

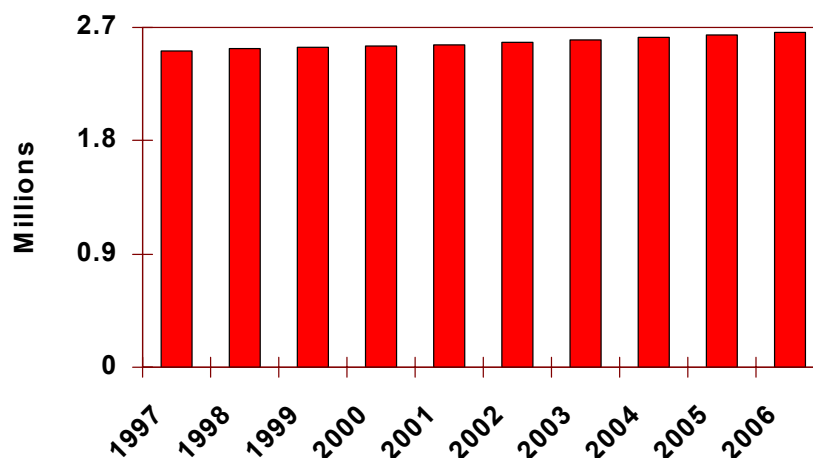
The Central Statistical Office (CSO) prepared the most recent set of population projections, *Zimbabwe Population Projections, 1992-2007*, which were published in 1995. The CSO projections do not take HIV/AIDS into account and underestimate what

turned out to be a more rapid fertility decline than expected. CSO has not had resources or staff to update the projections since that time, despite the availability of a 1997 intercensal demographic survey.

In any case, the Ministry of Education, Sports and Culture (MoES&C) tends not to use these kind of projections in its educational planning, so the fact that HIV/AIDS is not considered in the CSO projections is not really affecting the way the ministry is thinking about the sector. What the ministry has done is to project primary and secondary enrollments by province for the 1997-2006 period. These projections appear to be based on an extrapolation of actual experience in the country in recent years.

The totals for Zimbabwe are indicated below. They show primary enrollments growing from about 2.51 million children in 1997 to 2.66 million in 2006, an increase of less than 6 percent in 9 years. (By contrast, the primary school age population grows by more than 40 percent over the same period of time in the CSO projections, providing compelling evidence that the Ministry of Education, Sport and Culture is not depending on the CSO projections in its planning.) Based on the enrollment projections, MoES&C believes that the primary sector is going to be growing slowly over the first decade of the century. But

Projected Primary Enrollments 1997 - 2006



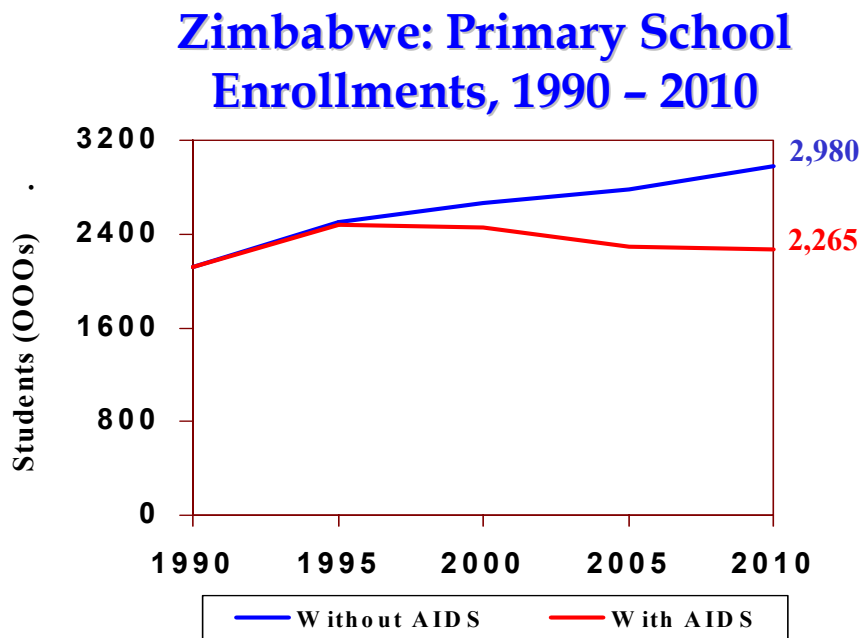
as will be indicated below, the ministry projections still seem to miss the impact of the HIV/AIDS epidemic and consequently overestimate the future size of the primary sector.

The Government of Zimbabwe is organizing a study on the impact of HIV/AIDS on education in Zimbabwe. A major effort to be funded by UNICEF and the World Bank is already in the planning stages. This study will take a closer look at the situation in each of the provinces and will give the government a clearer picture of sectoral needs over the next 10 years. While the government is not currently incorporating assumptions about

HIV/AIDS into its sectoral planning, this is a situation that may well be rectified in the foreseeable future.

Demand for Educational Services

Because HIV prevalence is so high in Zimbabwe, it is not surprising that the HIV/AIDS epidemic is affecting the demand for educational services. The following projections use a gross enrollment ratio of 1.073, about what has prevailed for the past several years. In these circumstances, the number of primary students in the Zim-Without AIDS projection grows from about 2,510,000 in 1995 to 2,670,000 in 2000 and 2,980,000 in 2010. Between 2000 and 2010, the number of primary students only increases by about 12 percent. This kind of growth is consistent with the projections being used by MoES&C.



Under the Zim-With AIDS projection, however, the primary education sector is actually shrinking in size over time. The number of primary students peaks at about 2, 510,000 in 1997, then drops to 2,265,000 by 2010.* This represents a decline of nearly 10 percent. By 2010, the number of primary students is nearly 24 percent smaller than it would be in the absence of HIV/AIDS. Clearly, the epidemic is having a major impact on the sector.

* The number of primary students is determined by first calculating the size of the school age population (6 to 12 year olds). This takes into account the effects of declining fertility and mortality change, including AIDS mortality. The size of the school age population is then multiplied by the gross enrollment ratio to determine actual primary enrollments. The projections do not make any assumptions about school attendance among orphans. Studies show that orphans have less access to schools than other children, and it is possible that actual enrollments may be even lower than those shown in the Zim-With AIDS projection because of the orphan factor.

The Zim-With AIDS projection can also be compared with the MoES&C projection. By 2006, the Zim-With AIDS projection shows about 17 percent fewer students than the ministry projections. The ministry projections end in 2006 but can easily be extrapolated to 2010. At that time, the number of primary students in the Zim-With AIDS projection is 21 percent less than the number in the ministry projections. HIV/AIDS is having a major impact on primary education in Zimbabwe that is not being picked up in projections being used by the ministry.

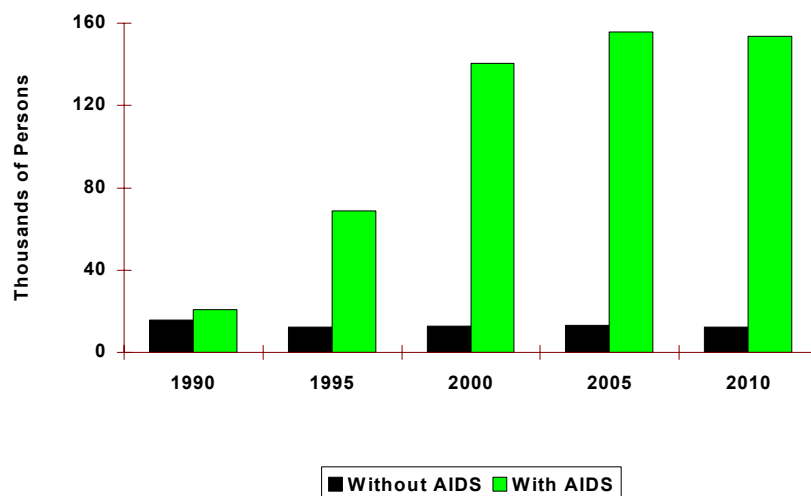
What does a shrinkage in the primary student population over a prolonged period of time mean for the number of schools? For teacher training? For recurrent expenditures? The HIV/AIDS epidemic is simply changing the way people are going to have to think about primary education in Zimbabwe.

Supply of Educational Services

Since the HIV/AIDS epidemic is so serious in Zimbabwe, it will affect the supply of educational services as well. However, MoES&C did not want to release whatever information it might have on teacher deaths for this analysis. (The issue revolved around releasing information prior to a UNICEF/World Bank-funded study later in the year.)

The impact of the HIV/AIDS epidemic on the supply of educational services can still be illustrated by looking at mortality in the 15 to 49 year old age group. In 2000, for example, mortality among 15 to 49 year olds is about 10 times higher in the Zim-With AIDS projection, compared with the Zim-Without AIDS projection. In 2010, the number of deaths to persons in the 15 to 49 year old age group is 12 times greater in the Zim-With AIDS projection.

Zimbabwe: Annual Deaths to Persons Ages 15 to 49, 1990 -2010



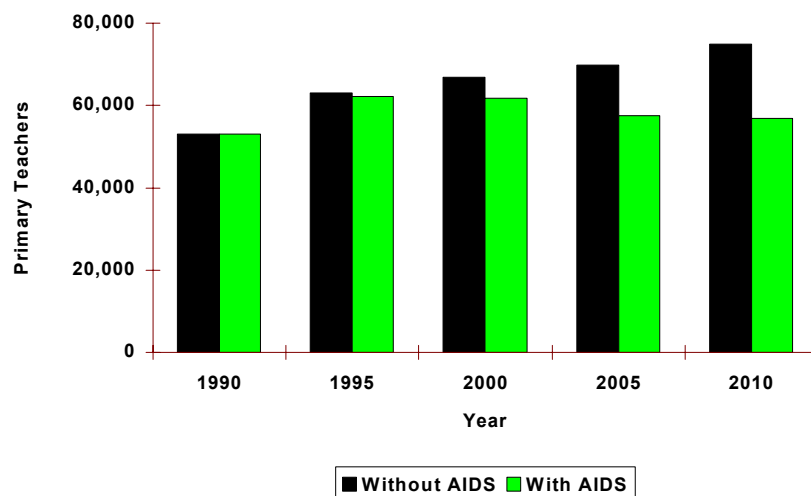
This high level of AIDS mortality inevitably will affect the supply of teachers and other education officers. Over the 2000-2010 decade, Zimbabwe will be losing about 2.1 percent of its teacher force to AIDS mortality each year. Morbidity as a result of HIV/AIDS will also subtract from the available amount of teacher and education officer labor. Using, once again, the assumption that an HIV-infected teacher is absent about 18 months as opportunistic infections invade the body with the breakdown of the immune system, Zimbabwe would lose about 3.2 percent of its available teacher labor to AIDS morbidity each year over the 2000-2010 period.

Impact on the Balance of Demand and Supply

Once again, if the HIV/AIDS epidemic is affecting both the demand for and the supply of educational services then how do these changes balance out in the end? Do changes on one side of the equation simply cancel out changes on the other? Primary school teachers can be used as an indicator to explore this question.

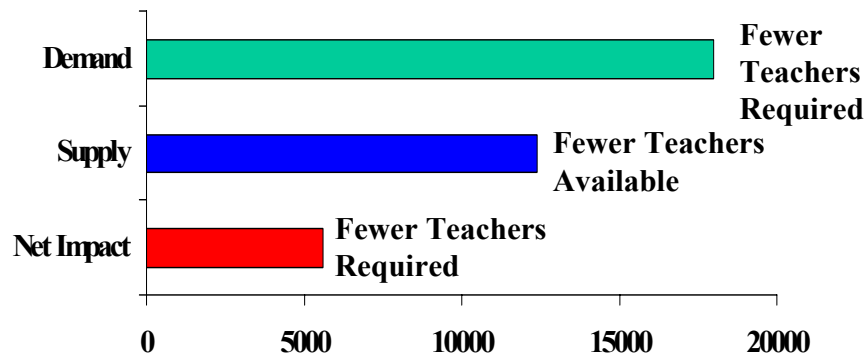
The graph below shows primary teacher requirements under the two population projections, assuming a primary student-teacher ratio just under 40. This ratio is the one used by MoES&C. The graph illustrates changes in the demand for educational services due to the HIV/AIDS epidemic. Under the Zim-Without AIDS projection, the required number of primary teachers would rise from 64,900 in 1997 to 69,800 in 2005 and 74,900 in 2010. Because the primary sector is shrinking in size over this period under the Zim-With AIDS projection, the required number of teachers would also decline, dropping to 57,600 in 2005 and 56,900 in 2010. The difference in the required number of teachers between the two projections is 18,000 teachers by 2010 or 24 percent.

Zimbabwe: Primary School Teachers Required, 1990 - 2010



Clearly, the HIV/AIDS epidemic is having a major impact on the demand for educational services in the country. But on the other side, a rough estimate is that the supply of teachers will be reduced by perhaps 12,400 over the same period of time because of AIDS mortality. That would reduce the difference to 5,600 teachers or about 10 percent of the required number of teachers under the Zim-Without AIDS projection. Zimbabwe follows the pattern of the other countries. Although to some extent changes on one side of the equation offset changes on the other, the net result is that the epidemic seems to influence the demand for educational services moderately more than the supply.

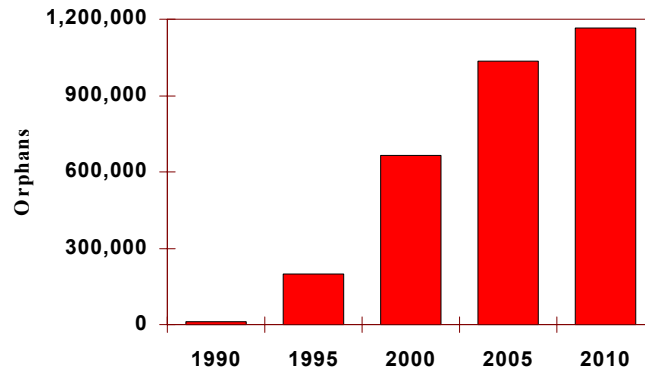
**Zimbabwe: Simulated Impact of HIV/AIDS
on Teacher Demand and Supply by 2010**



Potential Clientele for Educational Services

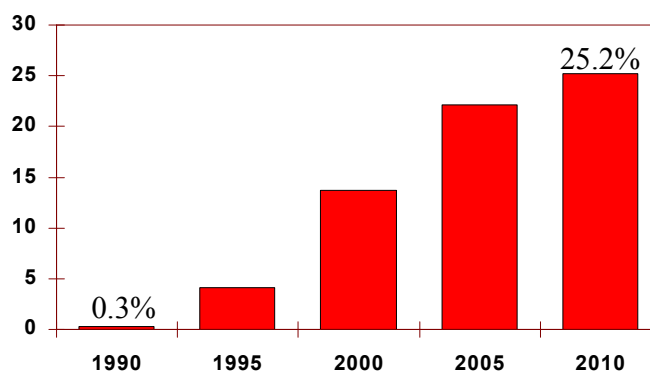
An HIV/AIDS epidemic of the magnitude that exists in Zimbabwe will seriously affect the clientele for education in the country. The number of maternal and double orphans as

Zimbabwe: Maternal and Double Orphans as a Result of AIDS, 1990-2010



a result of AIDS would increase from 198,000 in 1995 to 1,165,000 in 2010. In that year, just maternal and double orphans as a result of AIDS would account for fully 25 percent of the entire 0-14 age group. The numbers would look even starker when paternal orphans and orphans from other causes are added. At minimum, at least one-third of all children will be orphans in 2010 and, given the difficulty in estimating paternal orphans, the actual proportion may in reality be higher.

Zimbabwe: Maternal and Double AIDS Orphans as Percentage of 0-14 Age Group, 1990-2010



Use of the Education Sector for HIV/AIDS Prevention and Mitigation

Although the impact of HIV/AIDS has not yet been fully incorporated into educational sector planning in Zimbabwe, MoES&C, with UNICEF support, recently created an HIV/AIDS Secretariat within the ministry. This secretariat is mandated to develop and implement programs within the ministry and schools that address HIV/AIDS. MoES&C recognizes the critical role that the sector can play in addressing the epidemic. However, the HIV/AIDS Secretariat within MoES&C is new and is working with limited resources. It is looking for ways and resources to expand programs quickly given the devastating nature of HIV/AIDS in Zimbabwe.

Uganda

Status of the HIV/AIDS Epidemic

The story in Uganda is different than in the other countries. Uganda appears to be the one place in the region with a serious HIV/AIDS epidemic where prevalence has declined markedly in the 1990s. This decline is especially noteworthy because, at one time, Uganda was the poster-child for HIV/AIDS in Africa – the country where the epidemic exploded first; the country with the highest prevalence; and the country that automatically came to mind when discussing HIV/AIDS in the region. Yet now, at the turn of the century, HIV prevalence in Uganda is radically lower than what it is in Zimbabwe, Botswana and several other countries. HIV prevalence probably peaked somewhere in the 9 to 12 percent range in the late 1980s or early 1990s and now may well be in the 5 to 7 percent range.

Getting a sense of the course of the epidemic over time is complicated by some of the historical weaknesses in the sentinel surveillance system. In particular, there was never more than one rural sentinel site in any year prior to 1993. While rural sites have also shown a decline in prevalence over time, this drop is not as statistically significant as the prevalence decline in urban areas. Overall, the sentinel system gives a good picture of trends at particular sites, but it is more difficult to use the sentinel data to estimate national prevalence. This is because the sentinel sites are not necessarily representative of urban and rural populations in all parts of the country in all years.

As yet, no consensus position exists on the status of the HIV/AIDS epidemic in the country. The Uganda AIDS Commission, the body responsible for coordinating the national response to the epidemic, currently uses an estimated prevalence rate of 10 percent in its strategic planning.* It also works on the assumption that prevalence has stabilized at that level for several years. The AIDS Control Programme in the Ministry of Health, which is responsible for the sentinel surveillance system, suggests that national prevalence in 1998 was about 7 percent, with an overall decline still in process. The sentinel surveillance results from 1998 could easily be interpreted to imply a national prevalence rate of 6 percent or lower. (It would obviously be useful for Ugandan officials to try and arrive at a common understanding of the status of the epidemic. This process would help point out ways the sentinel surveillance system could be used to determine national trends.)

Agreement does seem to exist on the reality of the observed decline in HIV prevalence.** But why has HIV prevalence dropped so sharply in Uganda? Why did HIV prevalence in rural areas never really explode the way it has in Zimbabwe or Zambia? Uganda is perplexing because no one can quite determine what happened in the country to bring about a rapid drop in HIV prevalence. HIV/AIDS in sub-Saharan Africa is spread

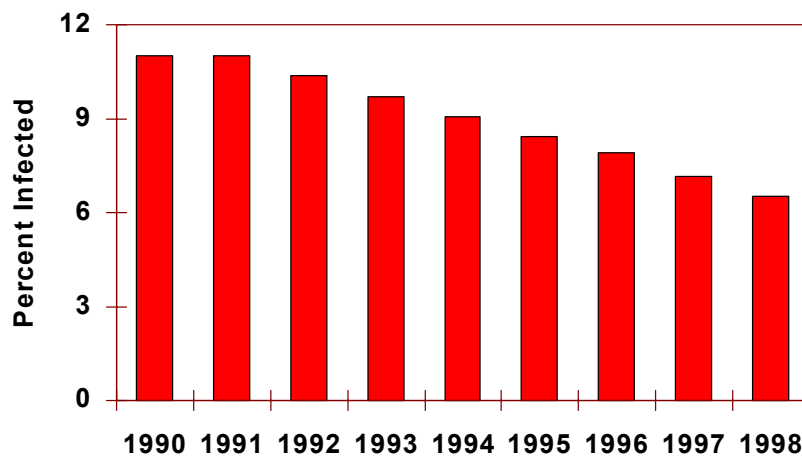
* The draft strategic plan does not indicate the derivation of the estimated prevalence rate.

** See, for example, Rand L. Stoneburner and Manuel Carballo. An Assessment of Emerging Patterns of HIV Incidence in Uganda and Other East African Countries: Final Report of Consultation. Geneva: International Centre for Migration and Health, 1997.

overwhelmingly by heterosexual contact, and it is only when large numbers of people change their sexual behavior or consistently take preventive measures that prevalence can decline. To some extent, this seems to be what has happened in Uganda. For example, surveys from the early 1990s and later in the decade show that 15 to 19 year olds are delaying the onset of sexual activity, are using condoms much more frequently especially in high-risk sexual encounters, and are having fewer sexual partners. But no one has been able to link behavioral change to any particular programmatic intervention.

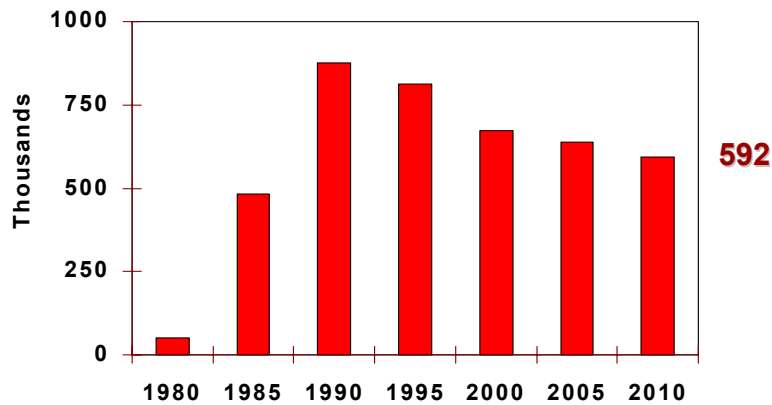
In any case, Uganda had one of the earliest HIV/AIDS epidemics in the region. HIV prevalence probably peaked in the 9 to 12 percent range in the late 1980s or early 1990s. Based on the sentinel surveillance data, adult HIV prevalence in 1998 was likely in the 5 to 7 percent range. The assumption used in this analysis is that HIV prevalence was 6.5 percent in 1998 and declines further to 4 percent by 2010.

Uganda: Estimated HIV Prevalence Ages 15 to 49, 1990-1998



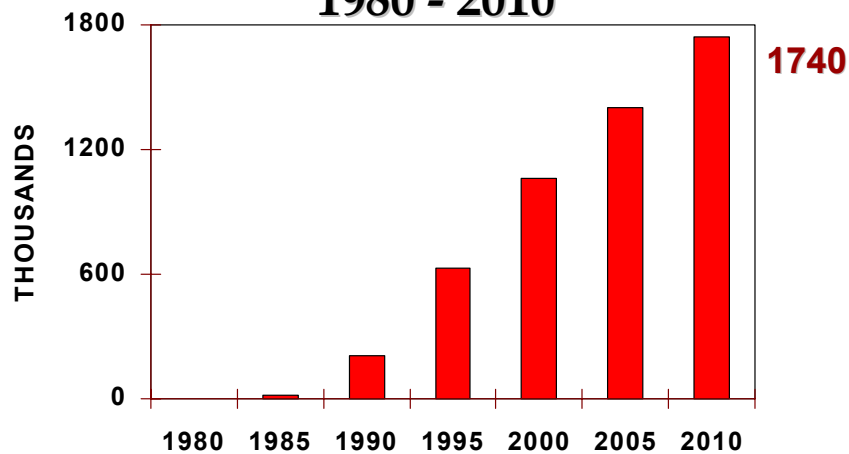
The next graph shows the number of HIV-infected persons. As might be expected with the decline in prevalence, the number of persons who are HIV infected declines over time, dropping from 812,000 in 1995 to about 674,000 in 2000. (This number is much lower than the number often used in Uganda, again underscoring the need for Ugandan officials to develop a consistent picture of the epidemic over time.) The number of infected persons, as projected, continues to decline after 2000, despite the fact that the Ugandan population continues to grow very rapidly at just under 3 percent per year.

Uganda: Projected Number of HIV Infected Persons, 1980-2010



Declining HIV prevalence is unusual in eastern and southern Africa. The new environment is reflected in HIV/AIDS media advertising in Uganda. Themes such as “AIDS is still a serious problem – don’t take risks” or “Let’s not let up our guard” now predominate. While the prevalence trend has been favorable, a situation where 5 to 7 percent of the adult population is HIV-infected is still a terrible tragedy for the country. Moreover, the impact of the epidemic is not over. This can be seen in the graph on cumulative AIDS deaths. By 2000, about 1,060,000 Ugandans have died since the onset

Uganda: Cumulative AIDS Deaths 1980 - 2010



of the epidemic. Between 2000 and 2010, perhaps another 680,000 persons are likely to die as a result of the disease. While not as dramatic as the situation in the higher prevalence countries, Uganda still has much to accomplish and much to endure before HIV/AIDS is relegated to an unpleasant past.

HIV/AIDS and Educational Planning in Uganda

Uganda has a 7-year primary education cycle, ages 6 through 12. It is a system undergoing radical change. Both as a strategy for long-term human resource development and as a component of social equity policy, the Government of Uganda has adopted an aggressive policy of universal primary education. The goal is to achieve a net enrollment ratio of 100 percent by 2003. Consequent to this policy, the number of new students entering primary school each year has been very high. In 1997, for example, nearly 2.2 million children were enrolled in Primary 1, about 3 times the number of 6-year olds in the country. The net enrollment ratio was a reported 85 percent already in 1999, up from 55 percent in 1991.

What does the particular course of the HIV/AIDS epidemic mean for educational planning in Uganda? Obviously, an environment where HIV prevalence is declining is much different than one where prevalence is either still rising or has stabilized at very high levels. The Statistics Department, Ministry of Finance and Economic Planning prepared official population projections for the country in 1994/95, based on the 1991 census. Not surprisingly, given the high profile of HIV/AIDS at the time, these do include assumptions about HIV/AIDS. (Interestingly, the Statistics Office used an earlier version of the AIDS Impact Model, the same projection software used in this analysis.) The projections assumed that prevalence would rise to 12.4 percent by 1997 (much higher than appears to have been the case) and then decline thereafter. By using this assumption, the Statistics Department projections actually moderately overstate the impact of HIV/AIDS.

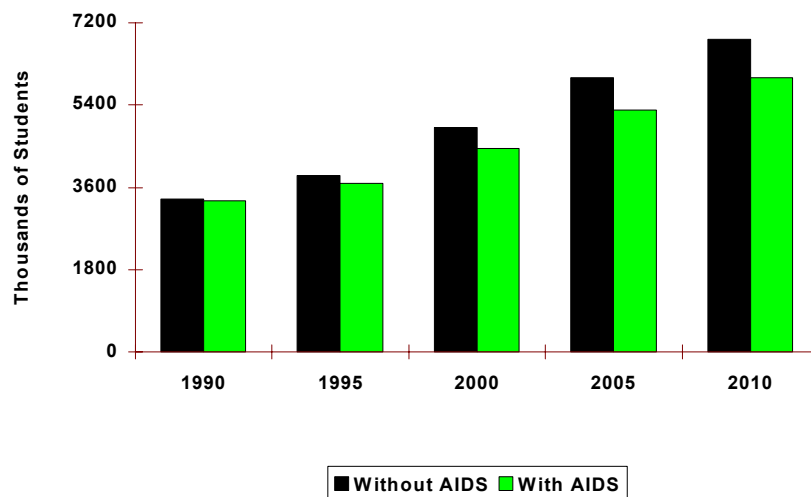
The Ministry of Education and Sports (MoES) does not appear to be especially reliant on the official projections in its planning processes. The *Education Strategic Investment Plan 1998–2003* (ESIP) is the current guiding document for the sector. This is in effect the implementation plan for education policies formulated as early as 1992. ESIP is not a particularly quantitative document. For example, it calls for universal enrollment of children of primary age by 2003, but doesn't indicate how many children that would entail. In turn, MoES has prepared quantitative projections for the primary sector to 2010, which are based on assumed intake each year and dropout rates at each of the seven levels of primary education, rather than on population projections of the primary school age group. How the intake at Primary 1 is determined is not quite clear though it is not based on any Statistics Department projections of the number of 6 year olds.

What is fundamentally determining the character of the primary sector in Uganda is recent efforts to make great strides in establishing universal primary education in the country. For example, MoES reported an intake of 2,160,000 students in Primary 1 in 1997, which would be about triple the number of 6-year olds in the country. In any country trying to move towards universal primary education so quickly from a low base, the gross enrollment ratio is going to be high well into the future. It is the large intake (and hopefully high continuation rates) that is affecting planning for the system much more than any variation in population projections.

Demand for Educational Services

What has been the impact of HIV/AIDS on the sector in a situation where HIV prevalence has been declining throughout the 1990s? Under the Uganda-Without AIDS projection, the number of primary school age children (6 to 12 year olds) would increase to about 6,830,000 by 2010. By contrast, under the Uganda-With AIDS projection, the number would be 5,996,000. This is a difference of about 12 percent and represents the cumulative impact of HIV/AIDS over time.

Uganda: Primary School Age Children 1990 - 2010



A third projection uses the assumptions from the Statistics Department projections in the AIDS Impact Model. The results show a primary school age population of about 5,640,000 in 2010. This number is about 6 percent less than the Uganda-With AIDS result, a difference that reflects the fact that the Statistics Department projections assume higher HIV prevalence than actually occurred.*

Supply of Educational Services

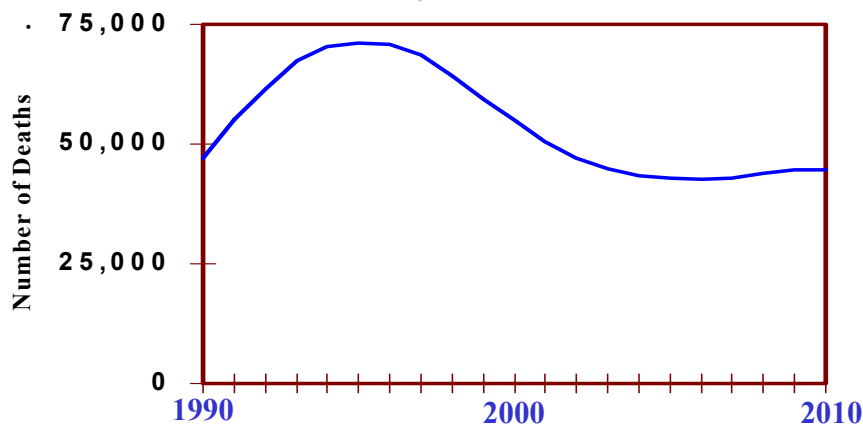
How is the HIV/AIDS epidemic affecting the supply of educational services? MoES reports 948 teacher deaths in 1997, up from 792 in 1996. A rough calculation indicates that perhaps 500 teacher deaths in 1997 could be attributed to AIDS. It is difficult to

* The Statistics Department projections also generate a somewhat different age structure than the AIM projections; consequently, the difference in the number of 6 to 12 year olds between the Uganda-With AIDS and the actual Statistics Department projections is even less than 6 percent.

judge the completeness of reporting on teacher deaths, but, at minimum, nothing in the data suggests that teacher mortality is higher than general adult mortality.

The graph shows trends in AIDS mortality among 15 to 49 year olds in Uganda. Because of the pattern of the epidemic in Uganda, annual adult deaths from AIDS peak in the mid-1990s and then decline for six or seven years before leveling off between 2003 and 2010. In 2003, for example, the projections suggest that there would be about 4.3 deaths for every 1,000 persons in the 15 to 49 year old age group. The ministry projects a need for 128,000 primary teachers in 2003 (assuming a pupil-teacher ratio of 55 to 1). At 4.3 deaths per 1,000 teachers, this would mean the loss of 550 teachers in that year or less than 0.5 percent of the primary teacher force. Uganda would continue to lose 0.4 to 0.5 percent of its teacher labor force each year for the remainder of the 2000–2010 decade.

Uganda: AIDS Deaths Among 15 - 49 Year-Olds, 1990 - 2010



Uganda would also lose some of its available teacher labor each year to HIV-induced morbidity. Using the assumption that HIV-infected teachers, on average, lose 18 months of professional time during the long progression of the disease, the epidemic would cost the country about 0.7 percent of its available teacher labor each year over the 2000–2010 decade.

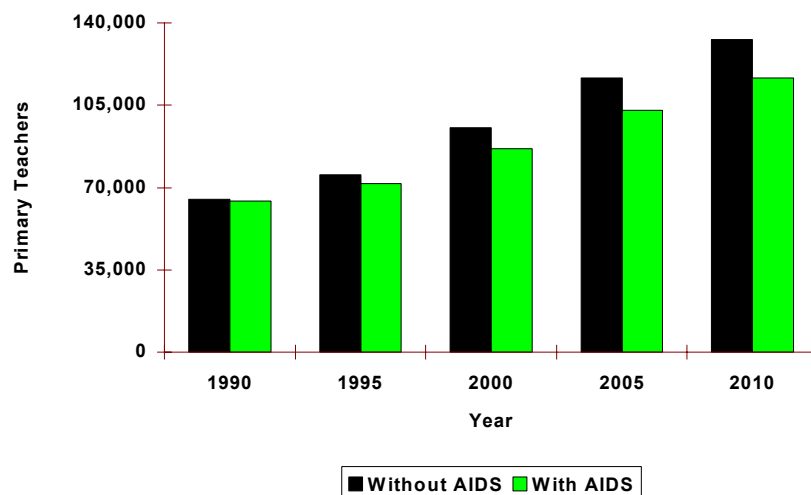
While certainly a terrible waste and a tragedy for the affected individuals and schools, these numbers do not suggest a radical disruption in educational services as a consequence of HIV/AIDS.

Impact on the Balance of Demand and Supply

How, then, does the epidemic in Uganda affect the overall supply and demand balance? These projections are hypothetical so as to isolate the turbulence caused by the HIV/AIDS epidemic from the turbulence caused by the radical increase in the number of new students in the lower primary levels. For purposes of comparison, they assume a gross enrollment ratio of 1.07 and a primary student-teacher ratio of 55.

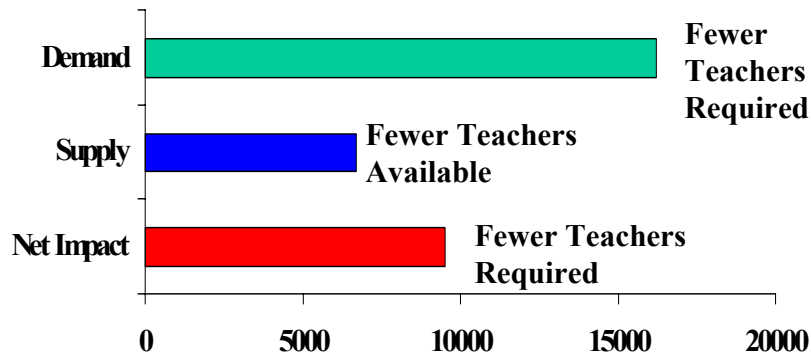
Using these assumptions, the graph indicates primary teacher requirements. Under the Uganda-Without AIDS projection, the required number of primary teachers would be 132,900 in 2010, but under the Uganda-With AIDS projection the required number of teachers would be 116,700 in that year. By 2010, the difference between the two projections would be 16,200 teachers.

Uganda: Primary School Teachers Required, 1990 - 2010



On the supply side, AIDS mortality would reduce the supply of primary teachers by an estimated 6,700 teachers over the 1990-2010 period. When both supply and demand are taken into account, the HIV/AIDS epidemic means that about 9,500 fewer teachers would be required in 2010 (about 6 percent of the required total) than would otherwise be the case. The pattern seems to be consistent. Over time, the epidemic affects the demand for educational services somewhat more than the supply. Still, relative to the turbulence caused in the sector by the move towards universal primary education, the HIV/AIDS epidemic has a lesser impact on the balance between the demand for and supply of educational services in Uganda.

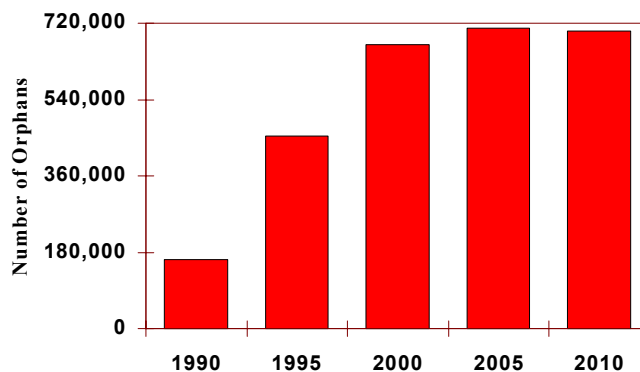
Uganda: Simulated Impact of HIV/AIDS on Teacher Demand and Supply by 2010



Potential Clientele for Educational Services

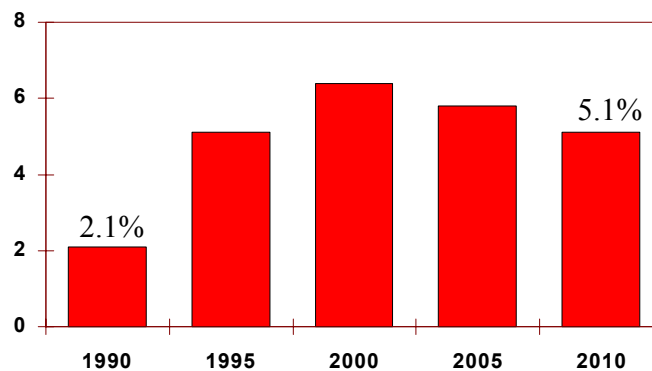
The question of the changing clientele for educational services also looks different in Uganda than in the other countries. The graph again shows maternal and double orphans as a result of AIDS. The number of orphans as a result of AIDS is 670,000 in 2000. Ten

Uganda: Maternal and Double Orphans as a Result of AIDS, 1990-2010



years later in 2010, the number stands at 700,000, only a 4.5 percent increase for the entire decade. For all practicable purposes, the number of orphans as a result of AIDS peaks in 2001. In 2010, about 5 percent of children would be maternal or double orphans as a result of AIDS, much lower than in the other countries in the study.

Uganda: Maternal and Double AIDS Orphans as Percentage of 0-14 Age Group, 1990-2010



While the issue remains a serious one, at least Uganda will not be facing the great surge in AIDS orphans over the 2000–2010 decade that will affect many of the other countries in the region. In fact, the proportion of children orphaned by the epidemic will actually be declining between 2000 and 2010. Consequently, the clientele for education services will not be changing further because of AIDS over the next decade. The more fundamental cause of turbulence in the system is the large influx of new students as the country strives for universal primary education.

Use of the Education Sector for HIV/AIDS Prevention and Mitigation

As noted, one of the perplexing issues surrounding HIV/AIDS in Uganda is that no one can quite determine why prevalence has dropped so quickly. Ugandans invariably identify the strong leadership of President Museveni early in the epidemic as a key factor. Because of President Museveni's leadership, discussions about HIV/AIDS have been open and frank from the early days of the epidemic. Some observers think that the wide diffusion of information about HIV/AIDS, the modes of transmission, the fatal consequences and ways to prevent infection has been a key to the decline in prevalence. In this view, IEC and voluntary counseling and testing programs, along with strong political commitment, have been especially important.

If information diffusion has been key, the education sector has not been a major player. HIV/AIDS programs in the schools began as early as 1992. A few activities – AIDS drama, for example – have been used extensively in schools throughout the country. Regardless, MoES officials state that school and teacher oriented HIV/AIDS programs have not been particularly strong. The ministry is now looking to strengthen programs so the sector can play a more active role in addressing the epidemic. The current Commissioner for Secondary Education has a long history with the Uganda AIDS Commission and is determined to strengthen the role the education sector is playing in addressing the epidemic.

IV. FINAL PERSPECTIVES

The HIV/AIDS epidemic is causing considerable turbulence in the education sector in the region, especially in the high prevalence countries of eastern and southern Africa. In some cases, this turbulence is not being captured in educational planning processes. In these countries, the situation obviously needs to be rectified by examining in detail the impact of the epidemic on the sector and the implications for educational planning.

HIV/AIDS and education sector impact studies can be considered from two perspectives. For those whose primary interest is in controlling the spread of HIV, the goal of studies looking at the impact of HIV/AIDS on the education sector is to motivate educational and other leaders to adopt strong measures to prevent the spread of the virus and mitigate the impact of the epidemic. For those whose primary focus is in making the educational system function as effectively as possible, the goal is to understand the impact of the epidemic on the sector and to elicit appropriate responses to mitigate its effects.

For those who are looking at sectoral impact studies to help motivate a strong response, it is not necessary to commit large amounts of resources or long amounts of time to such efforts. Smaller studies probably elicit as much of a political response as larger ones, provided the impact analyses are presented in a coherent and comprehensible manner. More extensive inquiries are justifiable, however, if the motivation is to understand the impact of the epidemic on the sector and how to respond to improve education for African children.

The education sector can be used to combat the epidemic – to limit the spread of HIV and mitigate its effects. In country after country in the region, HIV prevalence is negligible among 5 to 14 year olds but is much higher among 15 to 19 year olds and even higher among persons in their twenties and thirties. If the education sector can be used to diffuse information about HIV/AIDS and the deadly consequences of high-risk sexual activity, it can help contribute to different patterns of behavior among the upcoming generation.

In many of the high prevalence countries, officials recognize the important of using the education sector in an effort to control the spread of the virus and are eager to expand programs. What these countries need are resources, materials, and technical assistance to build programs as quickly as possible. In countries strongly motivated to use the sector to combat the epidemic, HIV/AIDS/education resources should be used disproportionately to develop and expand school and teacher-based programs.

HIV/AIDS is a development crisis that is destroying much that Africa has achieved over the past generation. The education sector can be used to combat the epidemic – to limit the spread of the virus; to support those who are HIV-infected or otherwise affected; and to lessen some of the intense social disruption that will come with high death rates and plummeting life expectancies. In turn, a decline in HIV prevalence would eventually help calm some of the epidemic-driven turbulence in the sector itself.

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