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## The Multisectoral Impact of the HIV/AIDS Epidemic – A Primer

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## **INTRODUCTION AND BACKGROUND**

The global HIV/AIDS pandemic continues largely unabated. If current trends persist, it is projected that 60 million more HIV infections will occur by 2015 and the annual number of new infections could increase by 20% or more by 2012.<sup>1</sup> Beyond the substantial human toll, the epidemic has broader impacts throughout many parts of a society, largely because HIV remains a fatal disease that primarily affects those who are young and in their most productive years. Because of this, HIV is considered a threat to overall development in many of the hardest hit nations, complicating efforts to reduce poverty, improve access to education and health care, address gender inequality, and maintain national security. This broader “multisectoral impact” is one of the more unique and salient features of the HIV pandemic and is important to understand for informing policy and planning efforts at all levels of society: a multisectoral impact necessitates a multisectoral response.

This primer provides an overview of the multisectoral impact of HIV/AIDS. It defines the concept; explains why it is of particular concern in the context of HIV; and summarizes both the key research assessing impacts to date in many of the worst affected countries and research forecasting, or modeling, potential impacts in the future. The sectors and areas examined include: *population structure and demographics; individuals and households; firms and the private sector; governments and the public sector; the health sector; education; agriculture and food security; and the macroeconomy*. The accompanying table (Table 1) presents select examples of the types of impacts HIV/AIDS has had on these various sectors or may be expected to have if the epidemic does not change course. It is important to note that although each of these sectors is discussed separately, they are intricately connected and overlapping, as are the effects of HIV on and across them.

### **What is meant by “multisectoral impact”?**

Phenomena, such as epidemics, do not take place in isolation. The interconnectedness of people, communities, and different levels of society and the economy means that such phenomena may extend far beyond their immediate consequences. A disease, for example, can permeate beyond its immediate clinical or biomedical manifestations. There may be a “ripple effect”—where one change can act as a catalyst, setting into motion a series of other changes. These may be immediate, sharp shocks or more complex, gradual and long-term changes that can result from the accumulation of impacts.<sup>2,3,4</sup> For example a sick worker may miss work due to illness and eventually vacate their job. This will have some effect, likely small or modest, on the worker’s place of employment. However, if many workers fall ill and leave their jobs, that impact will be more severe.

Impact may be felt at different levels: the micro-level (e.g. households); the meso/middle-level (e.g. economic sectors); and the macro-level (e.g., national economic growth, population structures). As such, multiple sectors of society stand to be affected. The impact will not be equal across all sectors, however, and will depend upon the unique characteristics and vulnerabilities of each. In the case of HIV, impact is felt at all levels and in many sectors including both public and private, health, education, agriculture, and other areas.<sup>2,3,4</sup>

### **Why does HIV/AIDS have a multisectoral impact?**

The impact of a disease or other phenomenon will also depend on its particular characteristics as well, including how it is spread, its incubation period, how many people it affects, their ages, what contributes to their vulnerability—including how stigmatizing a particular disease may be—and numerous other factors. Given this, there are several aspects of HIV which contribute to or

exacerbate its potential to have wider-ranging, societal impacts compared to many other infectious diseases that also affect developing countries. These include:

- HIV is essentially fatal. There is currently no cure for HIV, and an effective vaccine is likely years away. The treatments that are available, while critical for extending the longevity and quality of life for people with HIV, are not cures. Some of the other infectious diseases that significantly affect the developing world are curable, with appropriate access to existing treatments (although without access to treatment, these can also be fatal).
- HIV primarily affects young adults. Unlike many other infectious diseases which tend to have their biggest impacts on the very young or very old, HIV primarily affects adults in their most sexually active years which coincide with their most economically productive and reproductive years.
  - Both the peak age of HIV infection and the greatest mortality are among those between the ages of 20 and about 40.<sup>5,6</sup>
  - Of the estimated 2.9 million deaths due to AIDS in 2006, most (90%) were among adults, aged 15 and over.<sup>7</sup>
  - Under normal circumstances, this is a population group that is less likely to be ill or die compared to other age groups.<sup>2,8</sup>
- HIV has a very long incubation period, during which few, if any, symptoms are evident.
  - The lag time between infection with HIV and the onset of symptoms may be many years; the average time between infection and development of AIDS, the most advanced stage of disease, is between 9 and 11 years in the absence of treatment—and, as a result, the epidemic continues to spread unknowingly.<sup>6</sup> It is estimated that 8 in 10 people with HIV globally do not know they are infected.<sup>9</sup>
- There is significant stigma related to HIV disease. Due to stigma, people may not see themselves at risk, may not get tested and, if infected, may not seek treatment or if they do, face barriers to accessing needed services—all of which exacerbate the epidemic.<sup>1,5</sup>

## **THE MULTISECTORAL IMPACT BROKEN DOWN**

### **Impact on Population Structure and Demographics**

As described above, because HIV is still considered a fatal disease that primarily affects people in their most productive and reproductive years, it has the potential to impact the structure of a country or region's population. It is unusual for a disease to have such dramatic impacts on the demographics of a society. These demographic effects can be seen most clearly on mortality rates and life expectancy which, in turn, can affect the ratio of men to women, fertility rates, age structure, and overall population growth. Research has shown:

- Mortality has been increasing in the developing countries highly affected by HIV/AIDS.<sup>10</sup> HIV causes more deaths than most infectious disease in the world and it is the #1 cause of death in Sub-Saharan Africa.<sup>5,6</sup> There is also evidence that HIV has increased overall mortality in Asia and the Caribbean.<sup>5,6</sup>
- The shift in Sub-Saharan Africa is significant. Whereas prior to the epidemic, those aged 20-49 accounted for 20% of the region's overall deaths, they now account for 60% of deaths, largely due to AIDS.<sup>5</sup>

- Prior to the onset of the AIDS epidemic, many developing countries were experiencing significant gains in life expectancy. But estimates in many of the hardest hit countries indicate that those gains have slowed or even reversed in some cases due to HIV.<sup>5,6,10</sup> Life expectancy in southern Africa as a whole has fallen from 61 to 49 in the last 20 years.<sup>10</sup> In Botswana, life expectancy dropped from nearly 65 years in the period of 1985-1990 to 47 years in the 2000-2005 period.<sup>10</sup> South Africa, Swaziland, Zambia, and Zimbabwe have also seen drops in life expectancy.<sup>5,6</sup> Even in countries where prevalence rates are lower—Cambodia, Ukraine, Dominican Republic, Russia, and India—HIV/AIDS has slowed down increases in life expectancy.<sup>10</sup>
- There is the potential for HIV to alter the ratio of women to men since so many affected by HIV are women. Women account for almost half (48%) of all adults living with HIV/AIDS globally; they account for 59% of adults living with HIV/AIDS in Sub-Saharan Africa.<sup>7</sup> HIV infection rates typically peak among women 5 to 10 years earlier than men and women with HIV also tend to die earlier than men.<sup>5,6</sup>
- Because fertility tends to be lower for women with HIV than uninfected women, fertility rates are expected to decline; also, HIV-positive children born to infected mothers are not as likely to reach childbearing age.<sup>8,10,11</sup>
- AIDS related mortality and its impact on the potential number of births may reshape the age structure in highly affected countries. In South Africa, certain age groups are predicted to account for smaller shares of the population than they would in the absence of AIDS by 2015; the adult population could be 16% smaller.<sup>10</sup>
- Research has indicated that HIV is affecting population growth. Earlier studies found that some countries could experience zero or even negative population growth rates due to HIV. More recent studies still predict slower growth rates, but indicate that increased access to antiretroviral therapy and lower prevalence rates of HIV may mitigate the impact.<sup>2,8,10</sup>

### **Impact on Individuals and Households**

Within these larger demographic effects, the impact of HIV/AIDS is felt most directly and deeply at the individual and household levels; the worst impact is felt by the poorest populations. For a person living with HIV or AIDS, there are obvious clinical and medical consequences. Due to the morbidity of HIV/AIDS, an individual's ability to work and generate income is affected at a time when the individual is likely incurring new costs, largely related to medical care. The combination of higher expenses and reduced income threatens the livelihood of a family, their ability to secure food, pay for education, and save and invest. In response, households may “cope” by realigning their household expenses and making decisions that may have further implications. AIDS mortality also can affect the composition of families. Research has shown:

- In South Africa, a study conducted in Free State Province found that affected households had lower monthly incomes compared with non-affected households.<sup>12</sup>
- Medical expenses related to HIV/AIDS in poor South African households consume up to a third of income whereas the national average household expenditure on health care was four percent per year.<sup>13</sup>
- Funeral costs, on average, were four times the monthly income of households surveyed in South Africa.<sup>13</sup>
- Two-thirds of South African households surveyed experienced decreases in income and 40% reported that the primary caregiver had taken time off from formal or informal employment or schooling to take care of an infected individual adding to the loss of household income, as well as under-schooling of children.<sup>13</sup>

- In Thailand, 35% of households with an AIDS death felt a serious impact on agricultural production, leading to an almost 50% reduction in family income.<sup>14</sup>
- In India, research indicates that average monthly expenditures exceeded the income of families with a member living with HIV, partly because of a doubling in purchases of medicine.<sup>15</sup>
- Also in India, a study of HIV-affected households found that 43% had to borrow or liquidate assets to cope after a family member was detected to be HIV positive.<sup>16</sup> Research has also found that among HIV-affected households in New Delhi, many children were removed from school as a way to cope with decreasing incomes and increasing expenditures and that 17% of these children took up jobs to contribute to family incomes.<sup>15</sup>
- In general, studies have found that the epidemic tends to increase the number of female-headed households and the number of households in which grandparents are caring for children.<sup>17</sup> There are already an estimated 15 million children under 18 who have lost one or both parents to AIDS.<sup>5</sup>

The simplified diagram below illustrates how the illness or death of the head of household can set off a chain reaction of impacts.

*Morbidity/mortality of head of household → Higher costs for families (medical, funerary)/reduced income due to illness/death → Reduced savings → Household “copes” by taking child out of school and putting to work → Less opportunity for child as an adult*

### **Impact on Firms and the Private Sector**

By affecting adults during their prime working years, HIV/AIDS has the potential to impact the labor supply and, therefore, businesses and firms in the private sector. AIDS-related illness and death among employees may increase costs, reduce productivity and change a firm’s operating environment. Higher costs have significant implications for businesses, such as effects on profitability and competitiveness. Research has shown:

- HIV/AIDS has raised costs for businesses through: absenteeism due to the ill health of a worker or a member of the worker’s family; higher medical care and benefit costs; funerals costs for employees; employee attrition due to illness or death; and additional efforts needed to recruit new staff.<sup>2,18,19,20,21</sup>
- Almost 10% of South African companies surveyed indicated that HIV/AIDS has already had a significant adverse impact on their business; more than 40% predicted a significant negative impact over the five years following the survey.<sup>19</sup>
- In Kenya, a study of a tea estate found that HIV positive workers produced lower output in terms of kilograms of tea plucked and used more leave time compared to non-infected workers.<sup>22</sup>
- The impact of HIV on the consumer base also stands to affect business and markets. Some private sector entities in Africa, in examining potential effects, have posited that consumption patterns could change due to the demographic impact of HIV/AIDS, potentially necessitating strategic repositioning.<sup>2</sup>
- Beyond impacts in the “formal” sector made up of larger business and enterprises, most developing countries have a vast “informal” sector of small, self-run businesses (often accounting for significant shares of GDP<sup>23</sup>). While less research has been done in this area, a recent study focusing on South Africa’s informal sector, which accounts for 50% of total employment and 30% of its GDP, found that poor health was significantly associated with business closure. While the study did not focus on HIV/AIDS, the researchers write that the findings underscore the vulnerability of small businesses to HIV/AIDS.<sup>24</sup>

- Ultimately, the magnitude of the impact over time will depend on the extent to which the labor force is affected. The International Labor Organization (ILO) estimates that global labor force losses due to HIV could reach 45 million by 2010, and top 64 million by 2015, without increased access to antiretroviral therapy.<sup>25</sup>

### **Impact on Governments and the Public Sector**

Governments face some of the same issues as the private sector—illness and death of workers increases costs and reduces productivity. HIV/AIDS also poses special challenges for governments and the public sector. The epidemic increases demands on government and public services at a time when both human and financial resources may be compromised. HIV may also erode the revenue (tax) base of government by increasing mortality among adults in their prime productive years; revenue may be reduced further as the private sector—a key source of tax revenue—is impacted by the epidemic. These factors, when coupled together, have implications for how governments respond to the epidemic; the amount of resources available for addressing HIV/AIDS—including for prevention, treatment, care, and social support—as well as all the other areas governments are responsible for, including health, education, and justice; and the capacity of the governments to deliver services.<sup>2,26</sup> Specific impacts on education and the health sector are discussed below.

### **Impact on the Health Sector**

The sector most directly affected by HIV/AIDS is the health sector, both public and private. HIV/AIDS increases the number of people seeking services, the costs of health care for patients, and the need for health care workers. People living with HIV/AIDS need a wide range of health care services, often for many years. This increased demand is putting pressure on the limited health resources in many developing countries. Exacerbating this pressure is the threat to the supply of health workers—already severely short in number in many of the countries hard hit by HIV/AIDS—who are themselves at risk for infection. As more and more people turn to the public sector to help pay for health services after their own resources are depleted, governments will be faced with important choices regarding the response to HIV/AIDS. Research has shown:

- In some Sub-Saharan countries, people with HIV-related illnesses occupy more than half of all hospital beds.<sup>5</sup>
- A study in South Africa found that 28% of patients served in public and private health facilities in four country provinces were HIV positive; the figure was higher in public hospitals (46%). Patients with HIV stayed longer in hospitals than patients without HIV (nearly 14 and 8 days, respectively).<sup>27</sup>
- In one hospital in Nairobi, Kenya, HIV prevalence among patients rose from 19% in 1988/89 to 40% in 1997; hospital bed occupancy rose from 100 to 190%.<sup>28</sup>
- In Rwanda, a study found that HIV positive patients visited health facilities 11 times on average in one year as opposed to 0.3 times for the general population.<sup>29</sup>
- In South Africa, a study estimated that nearly 16% of health workers in both public and private facilities in four provinces were living with HIV/AIDS in 2002; among younger health workers (18-25), prevalence was estimated at 20%.<sup>30</sup>
- In Lusaka, Zambia, HIV prevalence was 39% among midwives and 44% among nurses in the early 1990s.<sup>31</sup>
- Botswana, a country with one of the highest HIV prevalence rates in the world, lost approximately 17% of its health care workforce due to AIDS between 1999 and 2005.<sup>5</sup>

- In many southern African countries, death from AIDS is the largest reason for exiting the health workforce. Those who remain experience increased workloads, which can lead to burnout and absenteeism.<sup>27</sup>
- While access to antiretroviral treatment is expanding in many hard hit countries, the labor and resources needed to deliver treatment may put additional pressure on the health system.<sup>5,32</sup>

### **Impact on Education**

Education is critical for development and the generation of human capital.<sup>33,34</sup> However, HIV has affected both the demand for (number of students) and supply of (number of teachers) education, and this is particularly the case in some African and Asian countries that already face significant challenges in their educational systems. Ultimately, the quality of education may be compromised. Research has shown:

- Deaths of children born with HIV and the removal of AIDS orphans and other children affected by the epidemic from school, result in smaller numbers of children needing education.<sup>2,5</sup> In Swaziland by 2016, it is projected that there will be a 30% reduction in the size of the primary school population for each grade.<sup>35</sup>
- In India, children aged 6-18 living in households with an ill family member were more likely than children in households without HIV to drop out of school in order to get a job or take care of younger siblings and other household work.<sup>16</sup>
- The epidemic has also created a population of children with new special needs (orphans, children living with HIV, children taking care of parents with HIV/AIDS).<sup>2</sup>
- In South Africa, 21% of teachers aged 25-34 and 13% of those aged 35-44 are estimated to be infected.<sup>5</sup>
- In Zambia, personal illness or taking care of family members account for over 60% of teacher absences. A survey carried out among teachers found that a five percent increase in a teacher's rate of absence, reduced students' average gains in learning by four to eight percent per year.<sup>36</sup>
- Tanzania estimated that 45,000 additional teachers are needed to make up for those who have died or left system because of AIDS.<sup>37</sup>
- At a time when teacher resources are declining, there are reports that the number of teachers being trained is not enough to fill the gaps in South Africa.<sup>5</sup>
- The average age, and therefore the level of training of teachers, is also expected to fall, which will mean that teachers may be less experienced.<sup>2</sup>

### **Impact on Agriculture and Food Security**

The majority of people in countries most-affected by HIV lives in rural areas, with many relying on farming and other rural occupations for subsistence and income. In fact, the agriculture sector is often the single largest source of employment in developing countries. Given agriculture's reliance on labor, illness and death directly affect productivity and, therefore, affect crop yields, the types of crops being cultivated, income, and, ultimately, food security. This sector already faces many challenges like drought, existing food shortages, and the extreme poverty of farmers, all of which are worsened by HIV/AIDS. Food insecurity is a particular challenge in the context of HIV—it is both exacerbated by and contributes to the epidemic's effect in hard hit areas that also suffer from food shortages. While the deepest impact is felt at the household level, there is some evidence of wider impact as well. Research has shown:

- By 2000, the agricultural workforces in 12 high-prevalence African countries were between three and 13% smaller than they would have been in the absence of AIDS.<sup>38</sup> By 2020, the loss could be 10% in some countries and over 20% in hard hit countries like Botswana, Mozambique, Namibia, and Zimbabwe.<sup>38</sup>
- A study in Zimbabwe found that agricultural output declined by nearly 50% in HIV-affected households.<sup>17</sup>
- In Lesotho, a lack of labor due to HIV has resulted in some agricultural fields being left idle.<sup>39</sup>
- A survey in Kenya found that poor households in rural areas do not recover quickly when the head of household dies; reduced crop production and income due to the death did not return to pre-death levels after three years following the death.<sup>40</sup>
- A study in Thailand showed that the loss of labor due to HIV/AIDS contributed to a shift away from labor-demanding crops like rice and chili to crops that need less labor like soya and onions.<sup>2</sup>
- A study in some of the most affected countries in Africa showed that slow growth in agricultural productivity and the overall economy resulted in growing food insecurity. For example, in Tanzania, grain production in 2010 is projected to be 34% less than the amount needed.<sup>17</sup>
- Food insecurity can heighten susceptibility to HIV exposure and infection and, for people living with HIV/AIDS, illness can be worsened by poor nutrition.<sup>41</sup>

### **Impact on the Macroeconomy**

The potential macroeconomic impact, or the impact on economic growth, of HIV/AIDS is a critical area to examine, yet difficult to measure. Economic growth is tied to job creation, higher living standards, and the resources governments have available—all of which have implications for overall development. Studies in this area have also looked at broader social development and welfare factors, such as human capital to assess the potential impacts. Research has shown:

- Most recent studies have indicated that AIDS has had some impact on the economic growth of some of the worst-affected countries, finding that their Gross Domestic Product (GDP—a commonly used measure of economic growth) grew more slowly than it would have without AIDS.<sup>2,3,17</sup>
- A preliminary analysis of South Africa's economy indicated that the country's GDP could be 17% lower by 2010.<sup>42</sup>
- A study in Botswana indicated that the country's economy could be 24-38% smaller by 2021.<sup>2</sup>
- Studies of potential impacts in Jamaica and Trinidad and Tobago have estimated that these two nations could lose 4-6% of their respective GDPs annually.<sup>43</sup>
- In Ukraine, it is projected that the country could experience a 1-6% reduction in GDP by 2014 due to the effects of HIV/AIDS.<sup>44</sup>
- Researchers suggest that the long-run economic costs of AIDS could be much higher than predicted to date, largely due to the destruction of human capital directly and through the weakening of mechanisms used to generate human capital (investment, income, education, knowledge transfers across generations).<sup>45,46</sup>

## **CONCLUSION**

As evidenced by the research presented above, HIV/AIDS is already having a profound impact beyond the millions of individuals it affects each year, hitting many levels and many sectors in the hardest hit countries. If current trends in the epidemic persist, these impacts will likely grow. Fortunately, some of this could be mitigated by broader access to comprehensive HIV prevention programs and antiretroviral treatment, as well as by the continued search for an effective HIV vaccine. Still, at present, there is no cure for HIV, an effective vaccine is likely years away, and millions more continue to become newly infected and die each year. As the epidemic persists and evolves, it will be increasingly important to monitor its larger effects in order to continually inform the response to HIV/AIDS at all levels.

**Table 1. The Multisectoral Impact of HIV: Selected Impacts from the Research Literature (Empirical and Projected)**

<b>Level/Sector</b>	<b>Selected Impacts</b>
Population Structure and Demographics	<ul style="list-style-type: none"> <li>• Mortality rates</li> <li>• Life expectancy</li> <li>• Fertility rates</li> <li>• Sex structures</li> <li>• Age structures</li> <li>• Population growth</li> </ul>
Individuals and Households	<ul style="list-style-type: none"> <li>• Morbidity</li> <li>• Mortality</li> <li>• Household income/Expenses related to illness/death</li> <li>• Use of “coping” strategies</li> <li>• Household composition (e.g., loss of head of household)</li> </ul>
Firms and the Private Sector	<ul style="list-style-type: none"> <li>• Worker absenteeism</li> <li>• Worker mortality</li> <li>• Labor force supply</li> <li>• Costs</li> <li>• Productivity</li> <li>• Revenue and Profits</li> <li>• Competitiveness</li> </ul>
Governments and the Public Sector	<ul style="list-style-type: none"> <li>• Worker absenteeism</li> <li>• Worker mortality</li> <li>• Costs</li> <li>• Productivity</li> <li>• Revenue</li> <li>• Government budgets</li> </ul>
Health Sector	<ul style="list-style-type: none"> <li>• Worker absenteeism</li> <li>• Worker mortality</li> <li>• Health workforce supply</li> <li>• Demand for services</li> <li>• Cost of services</li> <li>• Cost to governments</li> <li>• Health sector budgets</li> </ul>
Education	<ul style="list-style-type: none"> <li>• Child enrollment rates</li> <li>• Teacher absenteeism</li> <li>• Teacher mortality</li> <li>• Teacher/educator supply</li> <li>• Special needs of students</li> <li>• Quality of education</li> <li>• Human capital</li> </ul>
Agriculture and Food Security	<ul style="list-style-type: none"> <li>• Worker absenteeism</li> <li>• Worker mortality</li> <li>• Agricultural worker supply</li> <li>• Productivity</li> <li>• Income</li> <li>• Crop production</li> <li>• Food availability/security</li> </ul>
Macroeconomy	<ul style="list-style-type: none"> <li>• GDP</li> <li>• GDP per capita</li> <li>• Human capital</li> </ul>

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