HIV/AIDS and the Private Sector in Africa: Impact and Responses

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with

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on behalf of

The Commission on HIV/AIDS and Governance in Africa (CHGA)
United Nations Economic Commission for Africa

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CONTENTS

Chapter 1. Introduction.................................................................4
  1.1 Background and objectives of the study .................................4
  1.2 Prior research on HIV/AIDS and the private sector ..........5
  1.3 AIDS and commercial agriculture ........................................6
  1.4 Approach to the analysis .....................................................7
  1.5 Structure of the report ..........................................................8

Chapter 2. Kenya Case Study: Commercial Agriculture ...............9
  2.1 Background .........................................................................9
  2.2 Large company results .......................................................9
  2.3 Small company results ........................................................12
  2.4 Conclusions and issues for further consideration .............13

Chapter 3. Zambia Case Study: Commercial Agriculture ...............15
  3.1 Background .........................................................................15
  3.2 Large company results .......................................................15
  3.3 Small company results ........................................................18
  3.4 Conclusions and issues for further consideration .............19

Chapter 4. Zambia Case Study: Tourism .......................................21
  4.1 Background .........................................................................21
  4.2 Large company results .......................................................21
  4.3 Government agency results ................................................24
  4.4 Small company results ........................................................27
  4.5 Conclusions and issues for further consideration .............28

Chapter 5. Impact of HIV/AIDS on Private Sector Employment .......31
  5.1 Introduction .........................................................................31
  5.2 Model 1: a basic model for unskilled labour .........................32
  5.3 Model 2: an initial model for skilled labour .........................35
  5.4 Model 3: a more general model for skilled labour ...............37
  5.5 Model 4: what happens when skilled labour is very constrained? 41
  5.6 Summary of model findings ...............................................42

Chapter 6. Policy Implications and Conclusions .........................44
  What are the costs of HIV/AIDS in the workforce to large and small private sector employers? 44
  Are the strategies currently being pursued by private sector employers appropriate and sufficient, given existing knowledge about the effectiveness of workplace interventions? 45
  What is the likely impact of AIDS on the level of private sector employment? 46
  What are the implications of the answers to the first three research questions for government policy with regard to the private sector? 46

References ................................................................................49
Tables

1.1 Variables affecting the cost of AIDS to employers ............................................................6
5.1 Change in unskilled employment (Model 1) .................................................................34
5.2 Change in skilled employment—demand side impacts only (Model 2) ......................37
5.3 Change in skilled employment—demand and supply side impacts (Model 3) ...........40

Figures

1.1 Costs of HIV/AIDS to a company .....................................................................................7
1.2 Timing of cases and costs ................................................................................................8
2.1 Cost per employee lost to AIDS (Company K) ...............................................................10
2.2 Total cost of AIDS in 2004 (Company K) .....................................................................11
2.3 Net savings from treatment if all eligible employees are treated (Company K) ..........11
2.4 Agricultural managers’ views of the current and future impact of HIV/AIDS on their companies (Kenya) ...........................................................................................................13
3.1 Cost per AIDS-related termination (Company Z) ..........................................................16
3.2 Total cost of all AIDS-related terminations in 2005 (Company Z) .............................17
3.3 Net costs of treatment for full permanent workforce (Company Z) ............................17
3.4 Agricultural managers’ views of the current and future impact of HIV/AIDS on their companies (Zambia) .........................................................................................................19
4.1 Cost per AIDS-related termination (Sun International) ..................................................22
4.2 Total cost of AIDS in 2005 without treatment (Sun International) ...............................22
4.3 Net benefits of treatment (Sun International) .................................................................23
4.4 Budgetary cost per AIDS-related termination (ZAWA) ...............................................24
4.5 Impact on service delivery capacity per AIDS-related termination (ZAWA) ..............25
4.6 Total budgetary cost of AIDS-related terminations in 2005 (ZAWA) .........................25
4.7 Total service delivery impact of AIDS in 2005 (ZAWA) .............................................26
4.8 Net benefits of treatment (ZAWA) ..................................................................................26
4.9 Tourism managers’ views of the current and future impact of HIV/AIDS on their companies (Zambia) .............................................................................................................28
5.1 The unskilled labour market model (Model 1) ...............................................................33
5.2 The initial model for skilled labour (Model 2) ...............................................................36
5.3 The general model for skilled labour (Model 3) ...........................................................39
5.4 A constrained skilled labour market (Model 4) ............................................................41
CHAPTER 1.
INTRODUCTION

1.1. Background and Objectives

The Commission on HIV/AIDS and Governance in Africa (CHGA) was established to provide data, clarify the nature of the choices facing African governments today, and help consolidate the design and implementation of policies and programmes that can help contain the pandemic in order to support development and foster good governance. In pursuit of this mission the CHGA called for case studies “to understand the full impact of HIV/AIDS on Africa’s private sector and the governance challenges it poses for both business and governments on the continent.”

For private sector businesses in sub-Saharan Africa, HIV/AIDS is raising the cost of labour at the same time that it is reducing the number of consumers and impoverishing many of those who remain. It thus has the potential to reduce markedly the profitability of African businesses and diminish their competitiveness in the global marketplace. Given the critical role of the private sector in generating and sustaining employment and social and economic development in many countries in the region, adopting policies that help businesses remain profitable and globally competitive despite the costs of HIV/AIDS should be a high priority for African governments.

The appropriate role of the private sector in fighting the epidemic is hotly debated. Little attention has been given to the implications of HIV/AIDS for government policy on private sector development and for the relationship between government and business. Many international organizations and NGOs have called on businesses to contribute more actively to national HIV/AIDS strategies. A few major multinational companies have responded to this call, pioneering innovative prevention and treatment programs and participating in public-private partnerships. These companies remain the exception, however. The rationale for businesses to invest more in HIV/AIDS programs is unclear, and many firms are instead taking steps to “shift the burden” of the epidemic onto governments, households, and NGOs. As the epidemic matures, it is becoming increasingly important for governments to identify and adopt policies that achieve a socially desirable sharing of the economic burden of HIV/AIDS among the private, public, and household sectors.

This study was conducted to improve the information available to policy makers and business leaders as they struggle with these challenging issues. The study aimed to answer four research questions.

1. What are the costs of HIV/AIDS in the workforce to large and small private sector employers?
2. Are the strategies currently being pursued by private sector employers appropriate and sufficient, given existing knowledge about the effectiveness of workplace interventions?
3. What is the likely impact of HIV/AIDS on the level of private sector employment?
4. What are the implications of the answers to the first three research questions for government policy with regard to the private sector?
1.2. **Prior Research on HIV/AIDS and the Private Sector**

The potential impact of HIV/AIDS on the productivity and cost of labour in sub-Saharan Africa has long been recognized, but little rigorous empirical research on the magnitude of that impact has been published in the peer-reviewed literature. Unpublished case studies in Kenya and Botswana in 1994 found widely varying impacts, with costs ranging from less than 1% of profits to nearly 9%. Case studies in the mid-1990s reported low costs to businesses in Zambia, Malawi, and Botswana. A 2002 recent analysis in South Africa estimated a cost of 40% of an infected employee’s annual salary in each of the last two years of life. Most of these studies were carried out before AIDS-related morbidity and mortality had become widely manifest, and the quality of the methodology and data used were inconsistent and often poor.

In detailed case studies of six large private sector firms in South Africa and Botswana conducted between 1999 and 2002, we found that HIV/AIDS among employees increased wage and salary costs by 0.4-6.3% per year and that an incident HIV infection created a financial liability to the employer equal to 0.5-3.9 times the affected employee’s annual salary each year. Using the costing model developed for the southern Africa work, we also estimated the costs of HIV/AIDS to two large employers in Uganda in 2003. The results, unlike those for South Africa, were quite similar between the firms: HIV/AIDS increased wage and salary costs by 0.9% in one and 1.0% in the other.

Estimates of the costs of HIV/AIDS to employers typically incorporate both productivity losses due to illness ("indirect costs") and out-of-pocket expenses associated with losing an employee, such as medical care, end-of-service benefits, and recruiting and training replacement workers ("direct costs"). Indirect costs can, in turn, be disaggregated into two main types of effects: increased absenteeism and reductions in on-the-job performance, often labelled “impaired presenteeism.”

Several of the reports cited above found changes in absenteeism among HIV-positive workers. In the study we conducted in South Africa and Botswana, we found that in their last year of service, employees who died of AIDS-related causes took an average of 35.4 more days of sick leave than the annual average for the workforces as a whole, which was 6.3 days of sick leave per year.

Direct costs of HIV/AIDS to employers depend largely on employee benefits and labour policies. A 2003 survey of private companies in Uganda found that expenditures on employee medical care ranged from none to more than $400 per employee per year. A survey of companies in South Africa in 2004 found tremendous variation among firms in terms of their exposure to HIV/AIDS cost risks. Neither of these surveys, nor others that have been conducted in other countries, collected cost data from respondents, however—findings are based entirely on managers’ subjective answers to questionnaires.

The research cited above suggests that observed differences in the costs of HIV/AIDS to private sector employers are the result of several variables, in addition to idiosyncratic differences among the companies studied. Some key variables and examples are shown in Table 1.1.
### Table 1.1: Variables affecting the cost of AIDS to employers

<table>
<thead>
<tr>
<th>Variable</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial sector</td>
<td>Mining and manufacturing firms generally face higher costs than service and agricultural firms, probably as a result of differences in capital intensity, labour productivity, and workforce demographics.</td>
</tr>
<tr>
<td>Size of company</td>
<td>In South Africa, small and medium sized companies report much lower AIDS-related costs than do large companies, probably because direct costs of HIV/AIDS (employee benefits, recruitment and training costs) are lower.</td>
</tr>
<tr>
<td>Job level of employees affected</td>
<td>Morbidity and mortality among more skilled (and higher paid) employees impose higher costs on employers than they do among less skilled employees.</td>
</tr>
<tr>
<td>Company ownership (current or historical)</td>
<td>Multinational companies, parastatals, and companies with a history of foreign or colonial ownership tend to provide more extensive employee benefits and thus face higher costs when employees become ill or die.</td>
</tr>
<tr>
<td>Costs to employers vary directly with HIV prevalence in the workforce population and the composition of the workforce. Estimated prevalence among workforces studied in South Africa ranged from 8 to 29%; in Zambia, prevalence among managers at three companies was found to be just one fifth of that among semi-skilled workers.</td>
<td></td>
</tr>
</tbody>
</table>

### 1.3. AIDS and Commercial Agriculture

Two of the case studies presented in this report are of the commercial agriculture sector, for which concerns about the potential impact of HIV/AIDS have been raised. Commercial agriculture is a major contributor to the economies of many African countries. Crops like tea, coffee, cocoa, cotton, flowers, and tobacco are grown by both large and small commercial companies in many countries and account for large shares of formal sector employment, GDP, and exports. Most commercial agriculture companies are labour-intensive, relying on large numbers of relatively unskilled workers who are often employed on seasonal or casual contracts. While estate workers and working conditions are not entirely representative of a country’s labour force overall, the nature of the work on agricultural estates—arduous, outdoor, physical labour that often requires carrying heavy loads and repetitive actions such as bending over or swinging a blade or other tool—is similar to the type of work done by millions of smallholder farmers, miners, construction workers, and others.

Research on the impact of HIV/AIDS on commercial farms has produced fairly consistent results, though the number of studies is quite small. In Zambia, Malawi, and Swaziland, HIV/AIDS was estimated to be costing large agribusinesses roughly 1.1% of annual operating expenditures in 1995, 1996, and 1999, respectively. A survey of agribusinesses carried out in Kenya in 1998 estimated that HIV/AIDS-related illness accounted for an additional 1.6 days of sick leave per employee annually for all employees and caused medical and funeral expenses to rise considerably.10

More recently, a Boston University study in Kenya estimated that during their final year of employment, HIV-positive tea plantation workers are absent a total of 31 days more than other employees, are assigned less strenuous tasks 22 days more often, and harvest an average of 17% less tea leaf on days plucking tea. In aggregate, tea pluckers who died of AIDS-related causes produced 35% less tea in their last year of service than did other tea pluckers.17 The research that led to these productivity loss estimates provided the basis for the large company case study in this report.
1.4. **Approach to the Analysis**

The possible impacts of HIV/AIDS on an organisation—whether a private sector company, a government agency, or an NGO—are wide-ranging and go well beyond those arising from HIV infection in the workforce itself. A private company may see changes in the prices of inputs or the preferences of consumers, while a government agency is likely to face an altered set of demands for its services. For some companies, illness and deaths among employees will be the most important consequences of the epidemic; for others, external (market-level) effects will dominate. Figure 1 illustrates the three levels at which HIV/AIDS can impose costs on a company and the types of costs arising at each level. In the diagram, increased expenses or “direct costs” (column a) are recurrent operating expenses, while lost productivity or “indirect costs” (column b) are reductions in productivity or revenues resulting from HIV/AIDS.

**Figure 1.1: Costs of HIV/AIDS to a company**

<table>
<thead>
<tr>
<th>I. From one employee with HIV/AIDS (individual costs)</th>
<th>a. Increased expenses (Direct costs)</th>
<th>b. Lost productivity (Indirect costs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Benefits payments</td>
<td>• Increased leave and absenteeism</td>
<td></td>
</tr>
<tr>
<td>• Medical care</td>
<td>• Reduced on-the-job productivity</td>
<td></td>
</tr>
<tr>
<td>• Recruitment of a replacement worker</td>
<td>• Supervisor’s time</td>
<td></td>
</tr>
<tr>
<td>• Training of a replacement worker</td>
<td>• Vacancy until replacement is hired</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Poorer performance due to replacement’s inexperience</td>
<td></td>
</tr>
<tr>
<td>II. From many employees with HIV/AIDS (organizational costs)</td>
<td>• Benefits premiums</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Production disruptions due to missing skills, accidents, vacant positions, etc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Accidents due to sick or inexperienced employees</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Breakdown of workforce morale and cohesion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Litigation over benefits, dismissals, etc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Diversion of senior managers’ time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Deteriorating labour relations</td>
<td></td>
</tr>
<tr>
<td>III. From high HIV prevalence in society (market or external costs)</td>
<td>• Higher cost of material inputs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Reduced demand for products or services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• More security needed due to breakdown in civil society</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Higher risk premium on investment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Higher wages due to shortage of skilled workers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Higher cost of capital</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Higher cost of transactions with government and labour</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Costs of HIV/AIDS</th>
<th></th>
</tr>
</thead>
</table>

In this report we will look only at the internal costs of HIV/AIDS in the workforce (levels I and II). Direct costs that arise from individual employees with HIV/AIDS (Ia) are relatively predictable and easy to measure. Those that stem from multiple cases (Iia) are less predictable and require data that few organisations have. Indirect costs arising from individual cases (Ib) are difficult to measure, since the productivity of an individual worker in most organisations is very difficult to observe and may depend on the performance of an entire team.

Hardest of all to quantify are the productivity losses resulting from multiple cases of HIV/AIDS (Iib). These include such impacts as diminishing employee morale, the disruption of established work teams, the reduced efficiency of a workforce that has less experience and probably less skill, an increase in labour disputes as benefits and job security come under pressure, and the burden imposed on managers who must cope with worker illness and
deaths. Most of these costs are hidden, and in some cases they will not become evident until the epidemic is further advanced.

Once we have identified all the types of costs that might arise due to HIV/AIDS, we must know the timing of them. The long lag time between infection with HIV and death from AIDS—8-10 years on average if no antiretroviral therapy is available—makes this disease different from almost any other health problem a company, or a society, might face. Figure 2 is a timeline that reflects the natural progression of the disease, when treatment is not available. Although the costs are incurred over a long period of time and usually do not begin until 5 or more years after infection, an employer acquires the liability for that stream of future costs from the moment the employee is infected with HIV. As long as the employee remains in the workforce and does not have access to effective treatment, these costs are inevitable. Companies in Africa are now bearing the costs of HIV infections that were acquired by employees as long as a decade ago.

**Figure 1.2: Timing of cases and costs**

<table>
<thead>
<tr>
<th>Timeline (approx)</th>
<th>Progression of HIV/AIDS in the Workforce</th>
<th>Cost to Employer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 0</td>
<td>Employee becomes infected with HIV virus</td>
<td>No cost to employer at this stage</td>
</tr>
<tr>
<td>Year 0-8</td>
<td>Employee remains well and fully productive</td>
<td>No cost to employer at this stage</td>
</tr>
<tr>
<td>Year 5-8</td>
<td>Sickness begins (some early deaths, some long-term survivors)</td>
<td>Illness-related costs are incurred (absenteeism, productivity, management time, medical care)</td>
</tr>
<tr>
<td>Year 7-12</td>
<td>Employee leaves workforce due to death or retirement (some long-term survivors)</td>
<td>Termination-related costs are incurred (payouts from retirement fund, funeral expenses, loss of morale, experience, and cohesion)</td>
</tr>
<tr>
<td>Year 7-12</td>
<td>Company hires replacement employee (some employees not replaced)</td>
<td>Replacement-related costs are incurred (vacancy, recruiting, training, reduced productivity)</td>
</tr>
</tbody>
</table>

1.5. Structure of the Report

The rest of this report is structured as follows. In Chapters 2, 3, and 4, we present the results of three case studies of the impact of HIV/AIDS on the private sector in Africa. Chapters 2 and 3 look at the commercial agriculture sector in Kenya and Zambia, respectively; Chapter 4 focuses on the tourism sector in Zambia. In Chapter 5, we use the results of the case studies to develop an analysis of the implications of AIDS for employment and job creation by the private sector. Finally, Chapter 6 summarizes our findings and offers conclusions and recommendations.

It is important to note that this report is a summary of more detailed analyses described in the individual country reports. Country reports are available from CHGA or on the website of the Center for International Health and Development at Boston University: [http://www.bu.edu/dbin/sph/research_centers/cih_impact_hiv.php](http://www.bu.edu/dbin/sph/research_centers/cih_impact_hiv.php).
CHAPTER 2.  
KENYA CASE STUDY: COMMERCIAL AGRICULTURE

2.1. Background

In Kenya, as in many sub-Saharan countries, crops that are grown for commercial sale and export, such as tea, coffee, and horticultural products, account for a substantial share of GDP, foreign exchange earnings, and employment. Tea alone accounted for 18% of Kenya’s total export income in 2001. Kericho District, in the Rift Valley Province in the highlands of western Kenya, is the most important tea-growing area in the country, accounting for nearly a quarter of national production in 2003. Tea is produced by very large agribusinesses that both grow and process tea and by medium-sized and small companies that typically sell their produce to others for processing. There is also an active dairy industry in Kericho District. Other crops, such as maize and vegetables, are grown by smallholders primarily for household and local consumption.

HIV prevalence in 2003 in Kenya as a whole was conservatively estimated at 6.3% of the adult population. There is a good deal of regional variation within the country, however. Kisii, about 90 minutes by road from Kericho to the southwest, reported a prevalence of 12.7% among pregnant women attending antenatal clinics in 2001. Nakuru, a similar distance away to the east, reported a similar infection rate (12.2%). In contrast, Kisumu, a large city roughly the same distance away to the northwest of Kericho, reported 28.5%. Among workers and dependents on the largest commercial tea estates in Kericho, researchers have estimated adult prevalence at 10-14%, based on prevalence among VCT participants and a cohort being developed for vaccine trials.

Using detailed human resource, financial, and medical data, we estimated the costs of HIV/AIDS to a large tea plantation in Kericho District and modelled the potential net benefits of a treatment intervention. (To protect the identity of the participating company, we will refer to it in this report as “Company K.”) We also conducted a survey of 20 small and medium-sized commercial agriculture companies in the geographic area. In this chapter, we summarize the results of the case study.

2.2. Large Company Results

For Company K, which has 12,000 permanent employees and nearly 10,000 casual workers, we used data from the firm to estimate the costs it incurs each time an employee dies in service or is given medical retirement due to HIV/AIDS. These included costs incurred while the employee is ill, when he or she dies or retires, and while a replacement is being hired and trained. We then multiplied the estimated cost per death or retirement by the number of AIDS-related deaths and medical retirements the company was estimated to have suffered in

* This chapter was written by Sydney Rosen, Margaret Bii, Lawrence Long, and Matthew Fox.
† The full case study, and the other case studies presented here, are available from CHGA or from the CIHD website (http://www.bu.edu/dbin/sph/research_centers/cih_impact_hiv.php).
Finally, we modelled the potential net benefits to the company of providing effective treatment with antiretroviral therapy to all eligible permanent employees.

- The cost to the large company per employee lost to AIDS is shown in figure 2.1. The numbers above the columns show the total cost per termination as a multiple of the average annual salary in that job band. For skilled workers, for example, the cost of each AIDS-related termination is approximately $3,200, which is roughly three times the annual salary of a skilled worker.

**Figure 2.1: Cost per employee lost to AIDS**

![Cost per employee lost to AIDS](image)

- In order to extrapolate these individual costs to the company as a whole, we used existing, site-specific and national HIV prevalence data to estimate how many employees are likely to have died of AIDS-related causes in 2004. We estimated that aggregate HIV prevalence in the workforce is about 10%, and that 10% of HIV-positive people will die of AIDS in any given year. We then calculated the total cost of those deaths as a proportion of the company’s base labour costs. As shown in Figure 2.2, we found that the total cost of AIDS-related losses to the company in 2004 was equivalent to roughly 1.4% of the company’s salary and wage bill that year.
Finally, we modelled the potential benefits and costs to the company of providing effective treatment with antiretroviral therapy to all medically eligible permanent employees. We made a number of assumptions about the treatment programme which are detailed in the full report. Keeping in mind that this example is for illustrative purposes only, Figure 2.3 shows the annual savings to the company if all HIV-positive permanent employees have access to treatment at an average cost of $200/treated patient/year.

As might be predicted, treatment is highly “profitable” for managers and is a good investment for skilled workers. The financial benefits of treatment only partly offset the costs for unskilled workers. This analysis demonstrates, however, that for the workforce as a whole, a treatment program can have positive financial returns even for a commercial agriculture firm.
• The company we studied has long had an active program of HIV prevention for its workforce. With substantial financial and technical support from international donors, employees and their dependents now have access to antiretroviral therapy at the company hospital. One major challenge facing the company is how to sustain the treatment programme in the long run, after donor funding expires.

2.3. Small Company Results

To learn about the smaller companies, we assembled a roster of small companies engaged in commercial agriculture in Kericho District. A small company was defined as having 10-200 employees, including permanent and casual or casual staff. We randomly selected companies from the roster and ultimately completed on-site interviews with 19 companies. The questionnaire asked respondents, who were senior managers, about company characteristics, workforce characteristics and turnover, employee benefits, and HIV/AIDS issues.

• The 19 companies participating in the survey employed a total of 515 permanent employees and 171 casual workers, for an average workforce size of 27.1 permanent workers and 9-10 casual workers. All the companies were in the tea or dairy industry. The vast majority of permanent employees (85%) were classified as skilled or unskilled; each company employed on average only 1 manager and 3 skilled workers. Three quarters of those employed had no education or only some primary school.

• Few of the companies provided non-wage benefits to employees, with the exception of paid sick leave and funeral contributions, each of which were provided by 10 of the 19 companies (58%). Fewer than a quarter offered any kind of medical benefit.

• Overall annual attrition of permanent employees in the surveyed companies averaged 8.4% in the year preceding the survey, a rate slightly lower than that found among small companies in South Africa and Zambia. Nearly half (45%) of employee terminations in the year preceding the survey were due to death or illness. This amounts to rather high mortality in the employee population and suggests that HIV prevalence among small company workers is higher than in the large company’s workforce.

• The costs to the small companies of losing workers to AIDS were reported to be very modest. Absenteeism was not considered to be a problem. Only a few companies incurred any costs for medical care. Funeral contributions were more common but small in size. Finally, the companies reported spending little or nothing to recruit and train replacements for those lost to AIDS (or any other cause). Vacancies were brief or non-existent, and no investment was made in training.

• Consistent with the low costs incurred as a result of AIDS, most respondents perceived little impact of the epidemic on their companies now, and most of the rest a moderate impact, as shown in Figure 2.4. There is some concern that the impact on individual companies will become moderately more severe in the future, and all respondents ranked HIV/AIDS as a very important challenge for the future of their industry.
Finally, as might be expected in view of the low costs imposed by AIDS and managers’ perceptions of little or no impact, few of the companies have taken any steps to deal with HIV/AIDS in the workforce. About a third of the respondents said that their companies have actively sought information regarding HIV/AIDS, and a similar proportion had discussed it with their staff as a concern. The concerns discussed, however, focused entirely on behavioural and educational issues, not the potential financial or management implications of the disease. Almost two thirds of the companies had never undertaken any HIV/AIDS-related activity of any kind. Those that had were typically low-effort, low-impact interventions such as distributing educational materials.

2.4. Conclusions and Issues for Further Consideration

For the large company we studied, the average cost per employee lost to AIDS is between 1 and 3 years’ annual salary. In Kericho District, where adult HIV prevalence is estimated at 10%, HIV/AIDS is raising the cost of labour to large companies by 1-2%. These results are consistent with, though in the lower range of, findings from large companies in other sectors and in other countries in sub-Saharan Africa.

In small companies, employee losses due to morbidity and mortality—most of it presumably AIDS-related—are relatively high, but the impact of HIV/AIDS on the companies is modest. Companies spend little or nothing on employee benefits and training and therefore report very low costs associated with HIV/AIDS. There is little concern among small company managers about the impact of HIV/AIDS on their own business, though they express a high level of general concern about the epidemic for the future.

The large company we studied has an active HIV/AIDS programme that includes most of the standard workplace interventions for HIV prevention. Treatment with antiretroviral therapy is also available to all workers and dependents at the company hospital. Typical of subsidiaries of major multinationals, the company is doing most of what is currently expected of large employers in Africa. Small companies, in contrast, have done little or nothing to respond to HIV/AIDS and show little interest in taking action in the future.
Issues for Future Consideration

- For large companies with active HIV/AIDS programs, a major challenge is how to sustain both financial support and employee enthusiasm for the programs over time. Some companies, such as the one we studied, are taking advantage of donor-funded programs to provide HIV/AIDS services to employees. This is not likely to be a sustainable strategy in the long term, as donor funding will ultimately diminish.

- The tendency to employ increasing numbers of non-permanent workers (casuals) who do not have access to medical care or other benefits is gaining speed throughout the world and is by no means limited to commercial agriculture, to multinationals, or even to Africa. In projecting the demand for public sector prevention and treatment services, governments and donor agencies should distinguish between the permanent and non-permanent labour force.

- The lack of interest in HIV/AIDS shown by small company managers is consistent with findings of other surveys in South Africa and Zambia. Because small commercial agriculture companies rely on unskilled labour, invest little in recruiting and training workers, and offer few employee benefits, they generally incur relatively low costs as a result of HIV/AIDS. It would therefore be unwise to expect small companies in the commercial agriculture sector to take action against HIV/AIDS voluntarily.

- Despite the lack of small company interest, the fact that most managers rated HIV/AIDS as a “very important” challenge for the future of their industry may provide an opening for small company participation in programmes funded and organized by others (e.g. NGO workplace programmes).

- The data collected in Kericho suggest that, for the commercial agriculture sector overall, HIV/AIDS is a moderate problem. It makes labour more expensive and less reliable, and it likely distracts a good deal of managers’ time from more productive activities. Most companies, however—whether large or small—have adapted to these impacts and can probably continue to do so. There is thus little sign that HIV/AIDS alone threatens the sustainability or even the expansion of commercial agriculture in Kericho District.

- There remains a nearly complete lack of information about how effective workplace interventions are in offsetting the impacts of HIV/AIDS on private companies. Rigorous evaluation of a wide range of interventions is urgently needed if businesses are to make wise decisions about their response to HIV/AIDS—and for governments, NGOs, and donors to be able to assist them to do so.
3.1. **Background**

Like Kenya, Zambia is heavily reliant on commercial agriculture for foreign exchange earnings and formal sector employment. The country’s most important export crops are cotton, sugar, tobacco, and fresh vegetables. The case study was conducted in Central Province, with small companies selected from within Lusaka District. Farms and agricultural companies in this area generally produce low volume, high value crops, such as fruits, vegetables, dairy products, and flowers. Many companies produce solely for export or for both export and domestic consumption.

The most recent data on HIV prevalence in the general adult population of Zambia comes from the 2001-2002 Zambia Demographic and Health Survey. Although these data are several years old, it is unlikely that HIV prevalence has changed dramatically in the five years since the survey. Most of the companies in the case study draw their workforces from Lusaka and its environs, where average adult HIV prevalence was 23.1% in 2001.

Using detailed human resource data, we estimated the costs of HIV/AIDS to a large commercial farm in Central Province and modelled the potential net benefits of a treatment intervention. (To protect the identity of the participating company, we will refer to it in this report as “Company Z.”) We also conducted a survey of 29 small and medium-sized commercial agriculture companies in Lusaka District. In this chapter, we summarize the results of this case study.

3.2 **Large Company Results**

Company Z has more than 450 permanent employees, nearly 800 seasonal workers, and several hundred more casual workers. The vast majority of both permanent and non-permanent workers were employed as manual labourers who pick and pack the company’s crops. Two thirds of permanent employees are male, but among seasonal and casual workers, almost two thirds are female.

- The estimated cost to Company Z per employee lost to AIDS is shown in Figure 3.1. The numbers above the columns show the total cost per termination as a multiple of the average annual salary in that job band.

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‡ This chapter was written by Sydney Rosen, Petan Hamazakaza, and Lawrence Long.
Figure 3.1: Cost per AIDS-related termination

For skilled workers, diminished productivity when at work is the single largest cost, accounting for roughly a quarter of the total. For managers, the very large group life benefit accounts for more than half of the total.

- Applying population HIV prevalence data to Company Z’s workforce generates an estimated HIV prevalence among employees of 28.5%. Were this so, approximately 35 permanent and seasonal workers would be expected to die or retire each year due to AIDS. In fact, Company Z has experienced substantially lower mortality than this. In 2005, 13 employees died in service, well under half the expected number. The explanation for the low observed mortality among seasonal staff is straightforward: seasonal workers are hired on 6-month contracts which are renewed based on performance, and a chronically ill worker is unlikely to meet minimum performance standards. For permanent staff, HIV prevalence population may be lower than estimated, leading to lower AIDS-related mortality. In addition, at least some of Company Z’s employees are already on antiretroviral therapy, in some cases with financial assistance from the company. Finally, there may also be selective resignations among employees who are aware of their illness and choose to hide it from their fellow workers and/or return to a home elsewhere in Zambia.

- Based on actual rather than estimated mortality, the total cost of HIV/AIDS to Company Z in 2005 is shown in Figure 3.2. The numbers over the columns in Figure 3.2 represent the total cost of AIDS-related terminations in the job band as percentage of the total base salary bill for that job band.
Finally, we estimated the net costs to Company Z of providing treatment for AIDS with antiretroviral therapy to all permanent employees believed to have died of AIDS-related causes in 2005. We assumed a treatment cost of $300/patient/year. Results are shown in Figure 3.3.

**Figure 3.3: Net costs of treatment for full permanent workforce**

If all permanent employees estimated to have died of AIDS-related causes in 2005 had instead been treated under our hypothetical programme, the net costs to Company Z would have been quite small—roughly $600/year.
3.3. Small Company Results

- Of the 29 companies surveyed, most were engaged primarily in supplying agricultural inputs (38%), commercial farming (28%), or processing agricultural outputs (24%). The surveyed companies jointly employed a total of 2,566 permanent and 1,816 casual workers. The average workforce size was 89 permanent employees and 73 casual workers, while the median company employed 46 permanent and 13 casual staff. Almost two thirds of those employed were classified as unskilled or semi-skilled. A quarter were reported as skilled, and the rest as managers. Three quarters were male.

- The surveyed companies provide modest employee benefits. Three out of five provide or subsidize some form of medical care, most often through a contract with a private provider or by direct reimbursement of medical expenses. Almost all the companies offer death and/or funeral benefits and paid sick leave.

- Overall annual attrition of permanent employees in the surveyed companies averaged 14% in the year preceding the survey. Just 8% of this attrition was due to death (20) or medical retirement (9), equivalent to the loss of one permanent employee, or 1% of the workforce, per company per year. Based on reported cause of death, we estimated that up to three quarters of the deaths and medical retirements were AIDS-related.

- The costs to the surveyed companies of losing an employee to AIDS varied widely. Few expressed concern about sick leave increasing in recent years, but those who died in service in the past year were ill, on average, for almost three months prior to death. Funeral and death benefits are quite expensive, averaging $329 and $578 per death. For the employees who died in service during the year preceding the survey, companies reported spending, in total, an average of $1,728 per death. Few companies spent large amounts of money on recruitment or training of replacement workers, and vacancies were generally brief.

- We also asked respondents, who were typically the human resources manager or another senior manager of the company, about their perceptions of the impact of AIDS on their companies. Responses were consistent with the quantitative data about actual mortality and costs: 62% of managers interviewed perceive little impact now, and all of the rest a moderate impact. When asked about the future impact of AIDS, respondents were almost equally divided among no change (37%), a worsening of the impact (33%), and a lessening of the impact (26%). Perceptions of present and future impact are shown in Figure 3.4. Respondents rated HIV/AIDS seventh in importance among both concerns facing their own companies and challenges to Zambia’s commercial agriculture sector as a whole.
Finally, as might be expected in view of the low costs imposed by AIDS and managers’ perceptions of little or no impact, few of the companies have taken any steps to deal with HIV/AIDS in the workforce. Fewer than half of the respondents said that their companies have actively sought information regarding HIV/AIDS or discussed it with their staff as a concern. On the other hand, most companies (72%) reported having undertaken some HIV/AIDS-related activity, and frequently more than one. The activities that were most common—arranging educational sessions and providing educational materials—require relatively little effort or time on the part of company managers, but they do imply that many companies are aware of the need for workplace activities and willing to spend some money on them. Roughly a quarter of the companies surveyed indicated that they will pay for treatment of HIV/AIDS-related conditions and for ART.

3.4. Conclusions and Issues for Further Consideration

The financial costs of HIV/AIDS to many commercial agriculture companies in Zambia appear to be modest. Even for the large company, which should incur higher costs than do small companies, AIDS is estimated to increase labour costs by less than 2%. This is in part due to reliance on non-permanent and unskilled labour, and perhaps in part to the country’s expanding access to antiretroviral therapy.

In small companies, employee losses due to morbidity and mortality—whether AIDS-related or due to some other cause—account for only 8% of all employee attrition. Although many companies invest very little in their employees, beyond base salaries, many spend quite a lot on funeral and death benefits per employee death, making it in the companies’ interest to minimize mortality. Despite this, there is little concern among small company managers about the impact of HIV/AIDS on their own business or sector. They have done little to respond to HIV/AIDS and show little interest in taking action in the future. While about half the companies had arranged educational activities, only about a third had done more than that. This is not surprising, considering that almost two thirds of managers said that HIV/AIDS is currently having little or no impact on their companies. Because both mortality among employees and concern about the impacts of the disease are low, there is little incentive for managers to invest money, their own time, or workers’ time in interventions.
Issues for Further Consideration

- For the large company in the case study, a partnership with one or more public or private organisations engaged in HIV prevention, testing, care, and/or treatment may have benefits for all involved. With antiretroviral therapy soon to be available from a nearby public clinic, it seems unlikely that the company will fully subsidize such treatment itself. Instead, an argument can be made for the company to provide various policies and support services needed to make treatment successful and sustainable, and perhaps to extend these services to non-permanent staff and employees’ dependents.

- The lack of interest in HIV/AIDS shown by small company managers is consistent with findings of other surveys in South Africa, Kenya, and Zambia. Small commercial agriculture companies are heavily reliant on unskilled labour, in contrast to small firms in some other sectors, such as manufacturing or business services. Zambia’s high unemployment rate means that unskilled workers are easy and inexpensive to replace. Other business problems also weigh relatively heavy for small companies, which often struggle just to make ends meet. For these reasons, it would probably be unwise to expect small companies in the commercial agriculture sector to take action against HIV/AIDS voluntarily.

- Despite the current lack of small company interest, at least some companies may be willing to participate in programmes funded and organized by others (e.g. NGO workplace programmes). Small and medium-sized enterprises offer one clear advantage for HIV service delivery: a concentrated and captive population of adult men, who are notoriously difficult to reach outside of the workplace. Another opportunity that could potentially be pursued through a public-private partnership is to create a financial incentive for SMEs to provide more services.
a. Background

Tourism is among Zambia’s most important and promising opportunities for economic growth and employment creation in the coming decades. The country has a wealth of natural resources for tourism, including Victoria Falls, considered one of the greatest natural sites in the world and accessible via Livingstone, Zambia. Unlike many neighbouring countries, moreover, Zambia is peaceful and safe for visitors. As a result, international visitor arrivals in Zambia have more than tripled since 1995. Despite this evidence of success, assessments of the tourism industry in Zambia have pointed to a number of barriers to continued growth. Among these is the need for a well trained, experienced, and productive workforce at all levels, from the largest international hotels to the smallest guide companies.

HIV prevalence in Livingstone, where most of the research for the case study was conducted, is high. The 2002 antenatal clinic (ANC) survey estimated that 31.6% of pregnant women in the area are HIV-positive, the second-highest rate anywhere in Zambia. The Demographic and Health Survey conducted in the same year found lower levels of HIV infection than suggested by the ANC surveys, but overall prevalence among working-aged adults in urban areas, such as Livingstone, was still a worrisome 23.1%.

To describe and quantify the impact of AIDS-related morbidity and mortality on the skilled labour force in Zambia’s tourism industry, detailed data were collected from one tourism large company, one government agency involved in the tourism sector, and a sample of 30 small and medium-sized tourism companies located in and near Livingstone, Zambia’s tourism gateway.

b. Large Company Results

Sun International Zambia, the largest tourism company in Livingstone, runs two large hotels—the Royal Livingstone and the Zambezi Sun—and an entertainment centre within the borders of the Mosi-O-Tunya National Park. It has been in operation since 2001. It has approximately 350 permanent employees, supported by as many as 500 or more casual and contract workers. The permanent workforce, to which this analysis is limited, is roughly two-thirds male and is very young: the average age across all job levels is 32.

The estimated cost to the company per AIDS-related termination is shown in Figure 4.1. The numbers above the columns show the total cost per termination as a multiple of the average annual salary in that job band.

§ This chapter was written by Sydney Rosen, Petan Hamazakaza, and Lawrence Long with support from the U.S. Agency for International Development.
Figure 4.1: Cost per AIDS-related termination

To arrive at the total cost per year, an estimate of AIDS-related mortality is needed. Results from recent population and antenatal HIV prevalence surveys were adjusted for the age and gender structure of the Sun workforce, generating an estimated prevalence of HIV infection in the workforce of 36.8%. If mortality in an untreated HIV-positive population averages about 10% per year, a total of 12 Sun employees would be expected to terminate employment due to AIDS each year if no effective treatment were available.

Using this mortality estimate, the total cost of AIDS to Sun in 2005, in the absence of treatment, is shown in Figure 4.2. The percentages above the columns show the total cost of AIDS as a proportion of total annual salaries in that job band.

Figure 4.2: Total cost of AIDS in 2005 without treatment
Were no employees receiving effective treatment, HIV/AIDS would be increasing the cost of labour by ZMK 324 million ($71,000), or almost 11%.

It appears, however, that some, and perhaps many, employees *are* receiving treatment. Actual mortality in Sun’s workforce has been much lower than estimated: only 2 or 3 deaths per year, versus the 12 estimated above. There are two likely explanations for this discrepancy. First, Sun’s workforce is very young. Many HIV-positive employees were likely infected only in the past five years and have not yet become symptomatic. Second, there is access to effective treatment for AIDS in Livingstone, and many Sun International employees are already receiving antiretroviral therapy for HIV/AIDS. Up to 25 Sun employees—8% of the entire workforce—were on ART as early as September 2005. Many of the employees who became eligible for ART in 2004 and 2005, and perhaps earlier, are now being treated, reducing mortality and making the real costs of AIDS to the company much smaller than shown in Figure 4.2.

Effective care and antiretroviral therapy for HIV-positive employees has the potential to reduce the illness-related costs of the disease (absenteeism, medical care, etc.) and push the termination-related costs (death benefits, funeral costs) further into the future. Depending on the long-term effectiveness of the treatment and the age of the employee, these end-of-service costs might be avoided entirely. To see what the benefits of such a program might be for Sun International, a hypothetical treatment program was modelled, at a cost to Sun of $360/patient/year. The financial benefits of such a program are illustrated in Figure 4.3.

**Figure 4.3: Net benefits of treatment assuming full uptake by eligible employees**

If all employees who became eligible for ART in 2005—and who would have died that year had treatment not been available—were treated under the hypothetical program, the company would have saved more than ZMK 100 million. Although many employees are already obtaining treatment from private providers or the public hospital, an investment by the
company in making treatment universally available to its workforce and ensuring high uptake of treatment services would almost certainly have positive returns.

c. Government Agency Results

The Zambia Wildlife Authority (ZAWA) is responsible for protecting Zambia’s national parks and game management areas, the main draw for tourists to Zambia. Unlike Sun International, ZAWA is active throughout Zambia and has a widely dispersed workforce under central management. It has a workforce of approximately 1,450, of whom 90% are male and 70% serve as wildlife police officers or scouts in the parks.

The methods used to estimate the budget-related costs of HIV/AIDS to ZAWA were similar to those used for Sun International. For each ZAWA employee who dies in service of AIDS-related causes, an estimate was made of the expenses that ZAWA incurred while the employee was ill, when he or she died or retired, and while a replacement was being hired and trained. Because ZAWA is a public sector agency whose mandate is service delivery, however, rather than a for-profit company, it does not incur financial costs as a result of diminished productivity among employees. The impact of productivity losses is instead a decline in service delivery—in ZAWA’s case, a reduction in the organization’s capacity to patrol the national parks and wildlife management areas, which is its primary mission. A separate estimate was therefore made of the proportion of potential service delivery that ZAWA cannot provide as a result of AIDS-related morbidity and mortality.

The budget-related costs to ZAWA each time an employee terminates due to AIDS are shown in Figure 4.4. The numbers next to the columns show the cost as a multiple of the average annual compensation (salary + allowances) in that job band.

**Figure 4.4: Budgetary cost to ZAWA per AIDS-related termination**

![Figure 4.4: Budgetary cost to ZAWA per AIDS-related termination](image)

Figure 4.5 quantifies the loss of service delivery capacity ZAWA suffers per AIDS-related termination. On-the-job productivity loss was estimated by comparing the number of days...
spent on patrol in the parks by employees who ultimately died of natural causes with that of employees still in the workforce and presumed to be healthy.

**Figure 4.5: Impact on ZAWA’s service delivery capacity per AIDS-related termination**

In total, for the loss of a junior or senior member of staff, ZAWA loses the equivalent of 3.5 years’ annual compensation plus 1.4 person-years of service delivery capacity.

To arrive at the total estimated cost of AIDS per year, an estimate of AIDS-related mortality is needed. To obtain this, existing HIV prevalence data for urban areas were adjusted for the age structure of the ZAWA workforce. The resulting estimated prevalence of HIV infection in among ZAWA employees was 31.2%. If mortality in an untreated HIV-positive population is about 10% per year, a total of 45 ZAWA employees would be expected to die of AIDS-related causes each year. This estimate closely matches ZAWA’s actual natural cause mortality in 2005.

Based on the mortality estimate explained above, the total budgetary cost and service delivery impact of AIDS are shown in Figures 4.6 and 4.7.

**Figure 4.6: Total budgetary cost to ZAWA of AIDS-related terminations in 2005**

<table>
<thead>
<tr>
<th>Job Band</th>
<th>Total Budgetary Cost (ZMK)</th>
<th>Total Budgetary Cost as a Proportion of Annual Total Compensation for Job Band</th>
</tr>
</thead>
<tbody>
<tr>
<td>G8-G10 (junior)</td>
<td>$86,454</td>
<td>8.2%</td>
</tr>
<tr>
<td>G6-G7 (senior)</td>
<td>$224,901</td>
<td>10.2%</td>
</tr>
<tr>
<td>G1-G5 (managers)</td>
<td>$13,967</td>
<td>0.8%</td>
</tr>
<tr>
<td>Total</td>
<td>$325,322</td>
<td>8.2%</td>
</tr>
</tbody>
</table>
The analysis concludes that HIV/AIDS is increasing ZAWA’s labour costs by approximately 8% and reducing its service delivery capacity by almost 5%.

The high costs and large impact of AIDS in ZAWA’s workforce make investing in improved care and treatment, including antiretroviral therapy, for HIV-positive employees particularly important. Two different analyses of the potential costs and benefits to ZAWA of providing treatment both show that the organization would come out far ahead if employees no longer died of AIDS. The first, a straightforward cost-benefit of a hypothetical treatment program, with an estimated treatment cost of $500/patient/year and uptake of services by all eligible employees, is illustrated Figure 4.8. It suggests that the financial savings to ZAWA would be in the neighbourhood of $275,000/year, in addition to all of the social and ethical benefits of providing a life-saving therapy.
The second analysis looked at the “cost per patrol night produced,” as a proxy for ZAWA’s capacity to achieve its core mission of protecting Zambia’s parks and reserves. The analysis found that compared to a (non-existent) scenario in which all employees are HIV-negative, AIDS is increasing the cost per patrol night produced by 10%. Providing effective treatment for AIDS, while not fully eliminating the costs of the epidemic, generates a cost per patrol night estimate that is 5% lower than the status quo, in which many employees are ill but few are obtaining treatment.

d. Small Company Results

- Of the 30 companies participating in the survey, 60% were hotels or lodges, 30% tour or recreation companies, and 10% contractors to tour companies. They jointly employed a total of 983 permanent employees and 159 casual workers at the time of the survey. The average company in the sample employed 4 managers, 21 skilled workers, and 7 unskilled workers. Two thirds of the employees were male, and roughly 60% had at least a secondary school education.

- Compared to other industries studied in Zambia and elsewhere, the tourism companies surveyed offer relatively generous employee benefits, including subsidized medical care, death and funeral benefits, and paid sick leave. Many also invest more in training than do small and medium-sized companies in other sectors. As a result, the cost to the surveyed companies of losing an employee to HIV/AIDS is substantial. For the loss of a skilled worker, for example, the study estimated that the cost to a company is at least ZMK 6.5 million ($1,431), or just over one full year’s annual salary for a skilled worker.

- Among the companies surveyed, employee attrition in the 12 months preceding the survey averaged 12.4%. Illness and death were responsible for 15% of this attrition, or the loss of 1.7% of the workforce as a whole. Of those who died, 78% were skilled workers or managers; 86% had completed secondary school. Natural cause mortality was substantially lower than population HIV prevalence in Livingstone would suggest, however. There are several possible reasons for this discrepancy: lower than estimated HIV prevalence within the combined SME workforce; under-reporting of deaths by survey respondents; voluntary or involuntary terminations by employees who were becoming ill and chose or were forced to resign rather than remain employed; or access to antiretroviral therapy by some employees with AIDS.

- Consistent with the small number of deaths experienced—though perhaps not with the cost incurred per death—most respondents perceived little current impact on their businesses from AIDS, though more than half believed that the impact would worsen in the future. Current and future perceptions of impact are illustrated in Figure 4.9.
Figure 4.9: Managers’ views of the current and future impact of HIV/AIDS on their companies

When asked to rate HIV/AIDS as a concern for their own companies and for Zambia’s tourism industry as a whole, relative to other challenges facing the company and the sector, respondents ranked below most other issues, such as taxes and regulations, protection of tourism sites and maintenance of infrastructure, and economic conditions in general. Respondents generally regarded HIV/AIDS as a moderate problem for their companies and their industry, not their most serious concern for the future but of some importance.

- Finally, Livingstone’s tourism companies were somewhat more likely to have responded actively to HIV/AIDS than were small and medium sized companies surveyed in other countries and industries. Just over half of the respondents said that their companies had actively sought information regarding HIV/AIDS, and a similar proportion had discussed it with their staff as a concern. Five out of six companies were involved in at least one HIV/AIDS-related activity, most often by supporting HIV/AIDS programs in the community or implementing low-effort workplace prevention interventions, such as handing out condoms or educational materials. Only a few had spent the larger amounts of money needed to pay for care or treatment, however. The most common explanation given for not undertaking specific activities was that no one had ever asked for the activity—in other words, managers perceived no demand for HIV/AIDS services from employees.

4.5 Conclusions and Issues for Further Consideration

The case study found that morbidity and mortality associated with HIV/AIDS are reducing labour productivity sharply for affected employees who meet two conditions: 1) they are not receiving treatment; and 2) they remain in service throughout the course of the illness. The ZAWA data indicate that a wildlife police officer who dies of AIDS is only half as productive as other wildlife police officers for at least the two years preceding the death. Sun International employees who die of AIDS take nearly two months more paid sick leave than other employees in those last two years and are likely only 75% as productive when they do go to work. Small company managers reported similar losses of productivity.

Of the organizations studied, however, only ZAWA’s employees meet the two conditions specified above. Few of ZAWA’s staff currently have access to antiretroviral therapy, and as a government agency, ZAWA cannot easily dismiss or retrench sick workers. At Sun
International, it appears that a majority of those sick with AIDS are obtaining antiretroviral therapy. Among small companies, few managers in the Livingstone area reported being concerned about productivity losses in the workforce, and morbidity and mortality appear to be lower than predicted. Some employees must be receiving antiretroviral therapy, and it may be that many employees with HIV/AIDS do not remain in service until they die.

For Sun International, the cost of AIDS in the absence of treatment would be very large. We estimated that AIDS would be increasing Sun’s labour costs by nearly 11% if employees did not have access to treatment. The budgetary costs and mission impacts ZAWA incurs from AIDS in the workforce are in the neighbourhood of 8% of labour costs and 5% of service delivery capacity, respectively, imposing social costs on Zambia as a whole. If ZAWA were a private company whose object was to produce patrol nights, AIDS would be increasing production costs (cost per patrol night) by 10%. For smaller companies, the cost per employee lost to AIDS appears substantial—on the order of one full year’s salary—but the number of employees affected is relatively small. Smaller companies appear not to be aware of the costs they are bearing from AIDS in the workforce.

**Issues for Further Consideration**

One finding of this study that is consistent across all three types of organizations—large company, small companies, and government agency—is the potential for a positive return to investments in treatment of AIDS. For Sun International and ZAWA, there is no question that paying for antiretroviral therapy for a permanent employee is financially justified. Both organizations could spend a substantial amount of money to increase uptake of VCT and disease management services and still come out ahead. Even small and medium-sized companies would be better off paying for treatment for HIV-positive employees than incurring the costs of HIV/AIDS-related morbidity and mortality.

The study identified a number of possible strategies for reducing the costs of AIDS to employers in the tourism sector.

- Working in the tourism sector in Zambia appears to place young adults at high risk of HIV infection. Data from both Livingstone and from ZAWA nationwide suggest that HIV prevalence among tourism sector employees exceeds national averages. The tourism sector may thus offer an opportunity to target HIV prevention interventions to a high risk population that has previously been omitted from standard high risk categories and that is relatively easy to reach.

- Treatment of AIDS with antiretroviral therapy is clearly justified in financial terms for all the employers considered in this study, with the possible exception of the labour brokers that contract casual employees. In view of the shortage of skilled personnel in Zambia overall and the importance of tourism in creating employment and earning foreign exchange, treatment is also justified as a national investment in economic growth. The full report addresses a number of specific issues related to the provision and financing of treatment.

- Most of the companies that participated in the study belong to at least one business association. Many companies, and many ZAWA camps and offices, are located near other tourism companies and organizations. There may thus be opportunities for collective projects and partnerships that would lower the cost of intervening for all
participants, provide a platform for disseminating information, and improve the chances of obtaining external financial support. The Tourism Council of Zambia or the Livingstone Tourism Association could provide a starting point for such partnerships.

- AIDS-related morbidity and mortality are likely to remain very high in the tourism sector for some years to come. With better data about HIV prevalence and costs, both the Ministry of Environment, Tourism, and Natural Resources and private tourism companies and associations can consider the long-term training needs in the sector and, where possible, adjust training budgets and capacity.
CHAPTER 5.
IMPACT OF HIV/AIDS ON PRIVATE SECTOR EMPLOYMENT**

5.1. Introduction

Using the approach demonstrated in earlier chapters of this report, as well as other microeconomic and macroeconomic methods, a number of analysts have estimated the impact of HIV/AIDS on the cost of labour in sub-Saharan Africa. These studies across several countries and sectors typically show that HIV/AIDS has increased the cost of labour by roughly 0.5 to 6% annually, with most private sector companies experiencing labour cost increases of 1 to 3%.6,7 There have also been a handful of attempts to model the impact of the epidemic on the supply of labour, and in particular skilled labour, usually as an input to a macroeconomic model of the overall consequences of AIDS for economic growth.24,25 Neither type of analysis, however, has specifically considered the potential impact of AIDS on private sector employment in Africa. In view of widespread reliance on the private sector to create jobs and help lift millions of Africans out of poverty, it is important that African governments have a better understanding of how the epidemic may alter the potential of the private sector to contribute to employment goals.

The purpose of this chapter is to illustrate how HIV/AIDS, by changing the cost and supply of labour available to the private sector, can alter local labour markets in countries with high HIV prevalence. Using the findings presented in earlier chapters of this report on the estimated the impact of HIV/AIDS on the cost of labour, a range of partial equilibrium models of labour markets is developed to evaluate the implications of AIDS for private sector demand for labour.

We start with a basic partial equilibrium model that is applicable to markets for unskilled labour. We next create a model for skilled labour markets that incorporates the possible demand-side impacts of HIV/AIDS. We then extend the model for skilled labour to the case where HIV/AIDS also contracts the pool of skilled labour, so that both demand and supply side impacts are captured. For each model, we also conduct a numerical simulation using reasonable parameter estimates to show how to apply the models and to provide initial estimates of impact. These models are designed to illustrate how the epidemic might affect labour markets in general, not to evaluate any particular market. The models must be adjusted to local labour market conditions when applied to a specific country or sector with its own labour market regulations, such as minimum wage laws and collective bargaining agreements.26

** This chapter was written by Bruce Larson and Sydney Rosen, with assistance from Lawrence Long.
5.2. **Model 1: A Basic Model for Unskilled Labour**

We start by developing a simple model for the demand for unskilled labour in developing countries.

**Labour Supply in Model 1**

Most developing countries have a large pool of unskilled labour that is available to the private sector. We can thus assume that supply is infinitely elastic at some minimum wage \( w^0 \), as shown in Figure 5.1. In other words, there will always be enough unskilled labour available to meet demand, and we do not have to worry about constraints on the supply of unskilled labour in this model.

Note that \( w^0 \) is the full wage that a worker actually receives. For unskilled casual workers, \( w^0 \) is best thought of as the daily or hourly wage. For unskilled but permanent employees, \( w^0 \) includes the basic wage and any benefits received by employees (housing, medical care, pension, paid leave, training, etc.).

**Labour Demand in Model 1**

Let \( L = f(w) \) represent the derived demand for labour from the private sector, where \( L \) is the quantity of labour demanded and \( w \) is the full wage paid to employees (wages plus benefits).\(^{††} \) Private sector demand for labour is also a function of all other input prices \((r)\) and output prices \((p)\), such that \( L = f(w, r, p) \), but for now we will assume that \( r \) and \( p \) remain fixed. This allows us to omit them from the equations and reduce notational clutter.

To draw a typical demand and supply graph, we need to invert the function to find the private sector’s willingness to pay a wage \( w \) to labour, where \( w = f^{-1}(L) \). In competitive markets with profit maximizing firms, \( f^{-1}(L) \) is simply the marginal value product of labour \((pL(f(L, K)))\), where \( p \) is the output price, \( K \) represents all other inputs, \( f(L, K) \) is the production function, and \( f_L \) is the marginal product of labour). This inverse demand function is shown in Figure 1.

**The Initial Unskilled Labour Market Equilibrium**

The initial labour market equilibrium, where labour demand equals labour supply, is at wage \( w^0 \) and quantity of labour employed \( L^0 \) (Figure 5.1).

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\(^{††} \) We assume that the employers are private sector firms that are attempting to maximize profits in competitive markets. The logic of the models developed below can also be applied in other situations, such as non-competitive markets, regulated industries, cooperatives, and quasi-governmental companies, but the structure of labor demand would need to be developed in a way that is consistent with such alternative market structures.
Figure 5.1: The unskilled labour market model (Model 1)

The Impact of HIV/AIDS on the Labour Market

We know from the studies presented here, as well as from earlier research, that HIV/AIDS increases the costs to firms of employing labour. In our model, the full cost of labour to firms is now $w^* = w + a$, where $a$ is the additional cost of HIV/AIDS to the firm per unit of wages paid. Labour demand is now $L = f(w+a)$, where $w = f^{-1}(L)$ is the private sector’s willingness to pay for labour, and $a/w^0$, which we will call the “AIDS cost impact,” shows the percentage increase in full labour costs due to HIV/AIDS. The CHGA case studies and other research have found that $a/w^0$ is typically in the range of 1 to 3%, though for some companies and sectors it may be larger.

As shown in Figure 1, the increase in labour costs caused by HIV/AIDS $(a)$ directly reduces the amount companies are willing to pay workers $(w)$. Since willingness to pay to employees falls, but the unskilled wage rate $w^0$ is fixed, the quantity of labour hired in the market falls to $L^1$. In percentage terms, if we denote $dL = (L^1 - L^0)$ as the change in labour employed, then $dL/L^0$ shows the percentage change in labour hired in the private sector.

To estimate $dL/L^0$, we proceed as follows. The elasticity of labour demand with respect to wages, denoted here as $N_{lw} < 0$, shows the percentage change in labour hired for a 1% change in labour costs. The percentage change in labour hired $dL/L^0$ from an $a/w^0$ increase in labour costs is thus:

$$\frac{dL}{L^0} = N_{lw} \frac{a}{w^0} 100 < 0$$

For example, if $N_{lw} = -0.5$ and HIV/AIDS raises the cost of labour by 2%, equation (1) shows that 1% less unskilled labour will be employed in the private sector.

We could not locate any studies reporting private sector demand elasticities for unskilled labour in sub-Saharan Africa. For OECD countries, however, Hammermesh (1993, Table
3.2) reports 13 estimated labour demand elasticities from numerous studies that are conceptually consistent with $N_{Lw}$ in equation (1). The estimated elasticities range from close to zero to almost -2, but the average of the 13 studies is -0.88, and most are between -1 and 0. Hammermesh (1993, Table 3.2, 3.3, 3.4, and 3.5) also summarizes the results of many other studies that estimate labour demand elasticities based on the assumption that output of firms does not change if wages change. In almost all of these studies, which were conducted primarily in OECD countries but also in a few low- and middle-income countries, labour demand elasticities with respect to wages were between 0 and -1.0, with -0.5 as a reasonable average (meaning that, on average, a 1% increase in labour costs leads to a 0.5% decrease in labour employed).

Table 5.1 shows how the AIDS cost impact $a/w0$ and the labour demand elasticity $N_{Lw}$ interact to determine the final effect on employment. Three scenarios are provided in Table 1, with labour demand elasticities equal to -0.5, -1, and -1.5, respectively. For each scenario, the impact of AIDS on employment is estimated for cost increases of 1%, 3%, and 5%.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Labour demand elasticity $(N_{Lw})$</th>
<th>Change in employment $(dL/L_0)$</th>
<th>AIDS cost impact $(a/w^0)$</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>-0.5</td>
<td>-0.5%</td>
<td>Low cost (1% increase)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Middle cost (3% increase)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High cost (5% increase)</td>
<td></td>
</tr>
<tr>
<td>Scenario 2</td>
<td>-1</td>
<td>-1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Scenario 3</td>
<td>-1.5</td>
<td>-1.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7.5%</td>
<td></td>
</tr>
</tbody>
</table>

Not surprisingly, when the AIDS cost impact is small (1%), and the demand elasticity is small in absolute value (-0.5), the impact on employment is small as well (-0.5%). In settings where the AIDS cost impact is at the high end of existing estimates—roughly 5%—and the demand elasticity is high in absolute value, say -1.5, the effect on employment is much larger—a decline of 7.5%. Between these low and high estimates, AIDS-related reductions in private sector employment of unskilled workers in the range of 1.5 to 3% might be expected.
5.3. **Model 2: An Initial Model for Skilled Labour**

We now move to a consideration of skilled labour markets. To begin, we start with a simple model in which the supply of skilled labour is responsive to wages, but in which HIV/AIDS does not directly affect labour supply. Figure 5.2 illustrates this model.

**Labour Supply**

Unlike unskilled labour, skilled labour is typically in short supply in the workforce. It is therefore unlikely that the supply of skilled labour is infinitely elastic. In this case, let \( l = g(w) \) represent the supply of skilled labour in local markets, where \( l \) is the quantity of labour supplied and \( w \) is the wage rate paid to skilled workers. As shown in Figure 5.2, \( w = g^{-1}(l) \) is the aggregate willingness of skilled individuals to supply their labour in the market. The elasticity of labour supply to wages is denoted as \( N_{lw} > 0 \). In the short run, it is likely that \( N_{lw} \) is substantially less than 1, while in the longer run labour supply is probably more responsive to wage levels.

For this initial model of skilled labour, we assume that the supply of skilled labour does not act as a direct constraint on the labour market, and HIV/AIDS does not have a direct impact on labour supply. This assumption is relaxed in Model 3.

**Labour Demand**

We use the same notation as for unskilled labour, where \( L \) is the quantity of labour demanded, \( w \) is the full wage paid to employees (direct wages plus benefits), and \( a \) is the additional cost to the firm of employing labour caused by HIV/AIDS. \( L = f(w) \) is the derived demand for skilled labour from the private sector. We can invert this function to find the private sector’s willingness to pay a wage \( w \) to labour, where \( w = f^{-1}(L) \). This inverse demand function is shown in Figure 5.2.

**The Initial Skilled Labour Market Equilibrium**

The labour market is initially in equilibrium at wage \( w^0 \) and labour employed \( L^0 \). Any increase in labour costs \( a \) that is not paid directly to labour reduces labour demand, which is why demand shifts down by the amount \( a \) in Figure 5.2. When the demand for skilled labour falls, however, the wage \( w^0 \) is no longer fixed. The intersection of labour supply, \( w = g^{-1}(l) \), and labour demand, \( w = f^{-1}(L) - a \), generates the new labour market equilibrium \( L^1 = f(w^1 + a) = f(w^1) = l^1 \), with wages \( w^1 \) paid to skilled employees and the full cost to the private sector of skilled labour \( w^1 + a \).

In percentage terms, if we again denote \( dL = (L^1 - L^0) \) as the change in labour hired due to \( a \), then \( dL/L^0 \) shows the percentage change in labour hired in the private sector. To estimate \( dL/L^0 \), we need to include both the direct effect of \( a \) on labour demanded holding wages fixed (as in Figure 5.1) and the equilibrium impact on labour demanded through adjustments in the wage paid to skilled workers.
Figure 5.2: The initial model for skilled labour (Model 2)

The Impact on Skilled Wages

When the market is in equilibrium, demand equals supply, so that \( f(w + a) = l(w) \). Taking the total differential with respect to \( w \) and \( a \) and rearranging, the percentage change in wages paid to labour \( \frac{dw}{w_0} \) for an \( \frac{a}{w_0} \) increase in total labour costs to the private sector is:

\[
\frac{dw}{w_0} = \frac{N_{lw}}{N_{lw} - N_{lw0}} \frac{a}{w_0} 100 < 0
\]

Equation (2) concludes that the percentage change in wages paid to labour \( \frac{dw}{w_0} \) is negative. Because HIV/AIDS raises the full cost of labour to the private sector, wages paid directly to workers by the private sector fall.

The Impact on Employment of Skilled Labour

With \( L = f(w(a) + a) \), the full impact of \( a \) on private sector employment is:

\[
\frac{dL}{L^0} = \frac{dL}{L^0} |w^0| + N_{lw} \frac{dw}{w_0} 100 < 0
\]

In Equation (3), the percentage change in employment \( \frac{dL}{L^0} \) from an increase in total labour costs \( \frac{a}{w_0} \) now includes two impacts. The first term, \( \frac{dL}{L^0} |w_0| = N_{lw} \frac{a}{w_0} 100 < 0 \), is simply the direct effect of higher labour costs on employment given a fixed wage \( w_0 \), from equation (1). The second term, \( N_{lw} \frac{dw}{w_0} > 0 \), shows an offsetting increase in employment because the equilibrium wage falls.

To estimate this model for skilled labour empirically, three types of information are needed: (1) the labour demand elasticity \( N_{lw} \); (2) the labour supply elasticity \( N_{lw} \); and (3) the increase in total labour costs, \( a \), represented as a percentage increase from some initial wage, \( \frac{a}{w_0} \).
Table 5.2 shows how the AIDS cost impact \( a/w^0 \), the labour demand elasticity \( N_{lw} \), and the labour supply elasticity \( N_{lw} \) interact to determine the final impact on skilled labour employment. The scenarios and cost impacts are the same as in Table 5.1: labour demand elasticities equal to -0.5, -1, and -1.5, and AIDS cost impacts of 1%, 3%, and 5%. For all scenarios, a labour supply elasticity of 0.5 is assumed.

Table 5.2: Change in skilled employment—demand side impacts only (Model 2)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>AIDS cost impact ( (a/w^0) )</th>
<th>Low cost (1% increase)</th>
<th>Middle cost (3% increase)</th>
<th>High cost (5% increase)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>Labour demand elasticity ( (N_{lw}) )</td>
<td>-0.5</td>
<td>-0.5</td>
<td>-0.5</td>
</tr>
<tr>
<td></td>
<td>Labour supply elasticity ( (N_{lw}) )</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Change in wage ( (dw/w^0) )</td>
<td>-0.5%</td>
<td>-1.5%</td>
<td>-2.5%</td>
</tr>
<tr>
<td></td>
<td>Change in employment (fixed wage) ( (dL/L^0_{lw}) )</td>
<td>-0.5%</td>
<td>-1.5%</td>
<td>-2.5%</td>
</tr>
<tr>
<td></td>
<td>Change in employment given wage fall ( (N_{lw}(dw/w^0)) )</td>
<td>0.3%</td>
<td>0.8%</td>
<td>1.3%</td>
</tr>
<tr>
<td></td>
<td>Total change in employment ( (dL/L^0) )</td>
<td>-0.3%</td>
<td>-0.8%</td>
<td>-1.3%</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>Labour demand elasticity ( (N_{lw}) )</td>
<td>-1.0</td>
<td>-1.0</td>
<td>-1.0</td>
</tr>
<tr>
<td></td>
<td>Labour supply elasticity ( (N_{lw}) )</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Change in wage ( (dw/w^0) )</td>
<td>-0.7%</td>
<td>-2.0%</td>
<td>-3.3%</td>
</tr>
<tr>
<td></td>
<td>Change in employment (fixed wage) ( (dL/L^0_{lw}) )</td>
<td>-1.0%</td>
<td>-3.0%</td>
<td>-5.0%</td>
</tr>
<tr>
<td></td>
<td>Change in employment given wage fall ( (N_{lw}(dw/w^0)) )</td>
<td>0.7%</td>
<td>2.0%</td>
<td>3.3%</td>
</tr>
<tr>
<td></td>
<td>Total change in employment ( (dL/L^0) )</td>
<td>-0.3%</td>
<td>-1.0%</td>
<td>-1.7%</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>Labour demand elasticity ( (N_{lw}) )</td>
<td>-1.5</td>
<td>-1.5</td>
<td>-1.5</td>
</tr>
<tr>
<td></td>
<td>Labour supply elasticity ( (N_{lw}) )</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Change in wage ( (dw/w^0) )</td>
<td>-0.8%</td>
<td>-2.3%</td>
<td>-3.8%</td>
</tr>
<tr>
<td></td>
<td>Change in employment (fixed wage) ( (dL/L^0_{lw}) )</td>
<td>-1.5%</td>
<td>-4.5%</td>
<td>-7.5%</td>
</tr>
<tr>
<td></td>
<td>Change in employment given wage fall ( (N_{lw}(dw/w^0)) )</td>
<td>1.1%</td>
<td>3.4%</td>
<td>5.6%</td>
</tr>
<tr>
<td></td>
<td>Total change in employment ( (dL/L^0) )</td>
<td>-0.4%</td>
<td>-1.1%</td>
<td>-1.9%</td>
</tr>
</tbody>
</table>

The main conclusion from Table 5.2 is that the fall in wages \( (dw/w^0) \) induced by the AIDS cost impact \( (a/w^0) \) to some extent mitigates the negative effect AIDS on employment levels. In Scenario 2, for example, when the AIDS cost impact is 3% and the demand elasticity is -1.0, wages fall by 2%. As a result, while employment would have fallen by 3% in the absence of the wage adjustment, the final equilibrium outcome is a fall in employment of only 1%. Even for Scenario 3, where the AIDS cost impact is at the high end of existing estimates (5%) and demand elasticities are high in absolute values (-1.5), employment only falls by 1.9% because wages also fall by 3.8%. In the absence of the wage adjustment, employment would fall by 7.5%. The results in Table 5.1 and Table 5.2 show that labour cost increases due to AIDS can reduce employment, reduce wages, or reduce both, depending on labour market conditions. Which effect will dominate depends on the characteristics of the specific market under consideration.

5.4. Model 3: A More General Model for Skilled Labour

If skilled labour is in short supply in sub-Saharan Africa, HIV/AIDS is likely to affect directly both the demand for skilled labour and the supply of skilled labour. We know from Model 2 that demand for labour falls because the full cost of labour to companies increases (the increase \( a \) in the previous sections). To allow for changes in the number of skilled
workers caused by AIDS-related morbidity and mortality, in Model 3 we develop the link between skilled labour supply and HIV/AIDS. Model 3 is illustrated Figure 5.3.

Labour Supply

In the absence of an HIV/AIDS-related impact on labour supply (Figure 2), \( l = g(w) \) was used to represent aggregate labour supply, and \( L^0 \) and \( w^0 \) were the initial labour market equilibrium.

Now let \( b \) represent the number of skilled workers who fall out of the skilled labour market due to HIV/AIDS-related retirements and deaths. Labour supply is \( l = g(w) - b \), which is shown as \( w = g^{-1}(l+b) \) in Figure 3. The labour market equilibrium with HIV/AIDS is now \( L^2 = f(w^2 + a) = f(w^2)-b = l^2 \), with wages \( w^2 \) paid to skilled employees and the full cost of skilled labour to the private sector at \( w^2 + a \).

To estimate the full impact of HIV/AIDS on the skilled labour market empirically, we now need to include both the demand side impacts through \( a \) and the supply side impacts through \( b \). If we again denote \( dL = (L^2 – L^0) \) as the change in labour employed due to \( a \) and \( b \), then \( dL/L^0 \) shows the percentage change in labour hired in the private sector. To estimate \( dL/L^0 \), our equation must include 1) the direct effect of \( a \) on labour demand holding wages fixed (as in Figure 2); 2) the equilibrium impact on labour hired through adjustments in the wage paid to skilled workers due to an increase in costs \( a \); and 3) the equilibrium impact on labour hired through adjustments in the wage paid to skilled workers due to a reduction in labour supply \( b \).

The Impact on Skilled Wages

In equilibrium, demand equals supply so that \( f(w + a) = g(w) - b \). Taking the total differential with respect to \( w \), \( a \), and \( b \), the percentage change in wages paid to labour \( dW/w^0 \) due to \( a \) and \( b \) is:

\[
\frac{dw}{w^0} = \left. \frac{dw}{w^0} \right|_{b=0} + \left( \frac{1}{N_{lw} - N_{lw}} \right) \frac{b}{L^0} \times 100
\]

(4)

As Equation (4) shows, the percentage change in wages now has two components. The first term in (4) is a labour cost effect when \( b = 0 \), \( (dw/w^0)|_{b=0} \), which is identical to equation (2). The second term in (4) is a labour supply effect that shows the impact on labour supply \( b \) as a percentage of the initial labour market equilibrium \( L^0 \).

The term in Equation (4) \( 1/(N_{lw} - N_{lw}) > 0 \) simply shows how much of the labour supply impact \( b/L^0 \) is passed along to the labour market as higher wages for skilled employees. While wages always fall in the initial model of the skilled labour market (Equation 2), Figure 5.3 allows wages paid to skilled labour to rise as a result of supply effects. Importantly, however, Figure 3 could be easily drawn so that wages fall. Whether wages fall or rise in reality is an empirical question.
The Impact on Employment of Skilled Labour

With \( L = f(w(a, b) + a) \), the full impact of \( a \) and \( b \) on private sector employment is:

\[
\frac{dL}{L^0} = \frac{dL}{L^0} \bigg| w^0 + N_{lw} \frac{dw}{w^0} < 0
\]

Equation (5) is identical to Equation (3), except that Equation (4) is used when estimating \( \frac{dw}{w^0} \). As in Equation 3, \( \frac{dL}{L^0} \) is always less than 0, and the quantity of skilled labour employed will never rise.

To estimate this model empirically, four types of information are needed: (1) the labour demand elasticity \( N_{lw} \); (2) the labour supply elasticity \( N_{lw} \); (3) the increase in total labour costs \( a \) represented as a percentage increase from some initial wage, \( a/w^0 \); and (4) the impact of HIV/AIDS on the pool of skilled labour \( b \), represented as a percentage increase from the base employment level, \( b/L^0 \).

Table 5.3 shows the implications of Model 3 using the same assumptions as for Model 2 except that in Table 5.3, HIV/AIDS also affects the supply of skilled labour available in the market. We will assume that the supply impact is identical in magnitude to the AIDS cost impact, so that we consider the situation where a 1% labour cost increase due to AIDS is combined with a 1% decline in the supply of skilled labour, and so on. The three scenarios in Table 5.3 can be compared directly with the results in Table 5.2.
### Table 5.3: Change in skilled employment—demand and supply side impacts (Model 3)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>AIDS cost impact (a/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low cost (1% increase)</td>
</tr>
<tr>
<td>Scenario 1</td>
<td></td>
</tr>
<tr>
<td>Labour supply impact (b/L^0)</td>
<td>1.0%</td>
</tr>
<tr>
<td>Labour demand elasticity (nLw)</td>
<td>-0.5</td>
</tr>
<tr>
<td>Labour supply elasticity (nlw)</td>
<td>0.5</td>
</tr>
<tr>
<td>Change in wage (dw/w^0)</td>
<td>0.5%</td>
</tr>
<tr>
<td>Change in employment (fixed wage) (dl/L^0)</td>
<td>-0.5%</td>
</tr>
<tr>
<td>Change in employment given wage change (nlw(dw/w^0))</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total change in employment (dl/L^0)</strong></td>
<td><strong>-0.8%</strong></td>
</tr>
<tr>
<td>Scenario 2</td>
<td></td>
</tr>
<tr>
<td>Labour supply impact (b/L^0)</td>
<td>1.0%</td>
</tr>
<tr>
<td>Labour demand elasticity (nLw)</td>
<td>-1.0</td>
</tr>
<tr>
<td>Labour supply elasticity (nlw)</td>
<td>0.5</td>
</tr>
<tr>
<td>Change in wage (dw/w^0)</td>
<td>0.0%</td>
</tr>
<tr>
<td>Change in employment (fixed wage) (dl/L^0)</td>
<td>-1.0%</td>
</tr>
<tr>
<td>Change in employment given wage change (nlw(dw/w^0))</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total change in employment (dl/L^0)</strong></td>
<td><strong>-1.0%</strong></td>
</tr>
<tr>
<td>Scenario 3</td>
<td></td>
</tr>
<tr>
<td>Labour supply impact (b/L^0)</td>
<td>1.0%</td>
</tr>
<tr>
<td>Labour demand elasticity (nLw)</td>
<td>-1.5</td>
</tr>
<tr>
<td>Labour supply elasticity (nlw)</td>
<td>0.5</td>
</tr>
<tr>
<td>Change in wage (dw/w^0)</td>
<td>-0.3%</td>
</tr>
<tr>
<td>Change in employment (fixed wage) (dl/L^0)</td>
<td>-1.5%</td>
</tr>
<tr>
<td>Change in employment given wage change (nlw(dw/w^0))</td>
<td>0.4%</td>
</tr>
<tr>
<td><strong>Total change in employment (dl/L^0)</strong></td>
<td><strong>-1.1%</strong></td>
</tr>
</tbody>
</table>

The main implication of Table 5.3, when compared to Table 5.2, is that wages to skilled labour can rise, which in turn magnifies the impact of AIDS on total employment of skilled labour. For example, in the Middle Cost column of Scenario 2, the AIDS cost impact is 3%, the supply-side impact is also 3%, and the demand elasticity is -1.0. In this case, rather than wages falling by 2% as in Table 2, wages remain constant. As a result, while employment would fall by 1% in the absence of any supply side effects (Table 5.2), in the presence of supply side effects, employment falls by 3% (Table 5.3).

Scenario 1 and Scenario 3 in Table 5.3 show that the impact of the supply side effect can either increase or decrease the equilibrium wage. When labour demand is inelastic, as in Scenario 1, wages increase so that employment falls by more than in Model 2. For example, in the Middle Cost column of Scenario 1, employment would fall by 1.5% with fixed wages, but wages increase by 1.5% so that employment falls in total by 2.3%. When demand is elastic, as in Scenario 3, wages fall so that the impact on employment is mitigated to some degrees. For example, in the High Cost column of Scenario 3, employment would fall by 7.5% with fixed wages but ends up declining by only 5.6% due to the drop in wages.
5.5. Model 4: What Happens When Skilled Labour is Very Constrained?

In some countries and some markets, skilled labour is in very short supply, and demand is high enough that essentially all skill labour is employed. Figure 5.4 illustrates this model.

Labour Supply

Labour supply is fixed at some maximum amount, denoted as $L^0$ in Figure 5.4. In this case, labour supply becomes perfectly inelastic, $N_{lw} = 0$. $L^0$ and $w^0$ is the initial labour market equilibrium as shown in Figure 5.4.

As in the previous model, the higher cost of employed labour resulting from HIV/AIDS shifts labour demand down. If labour supply remained fixed at $L^0$, wages would simply fall by the amount $a$, and $a/w^0$ would be the percentage change in labour costs.

But as a result of AIDS-related morbidity and mortality, total skilled labour available also falls by the amount $b$, or in percentage terms by $b/L^0$. With $N_{lw} = 0$, the equation for this constrained labour market, depicted in Figure 5.4, is:

$$\frac{dw}{w^0} = -\frac{a}{w^0} 100 - \frac{1}{N_{lw}} \frac{b}{L^0} 100$$  \hspace{1cm} (5)

Depending on the relative magnitudes of $a/w^0$, $b/L^0$, and $N_{lw}$, wages for skilled labour could fall or rise, but the quantity of skilled workers employed has to fall by $b$. If $a/w^0$ is large relative to $b/L^0$, and labour demand is fairly responsive to wages, then wages will fall. On the other hand, when $a/w^0$ is small relative to $b/L^0$, and labour demand is not responsive to wages ($-N_{lw}$ is closer to 0), then wages of skilled workers will rise even as the total level of employment is falling.

Figure 5.4: A constrained skilled labour market (Model 4)
5.6. Summary of Model Findings

The four models presented above point to some general conclusions about the possible impacts of HIV/AIDS on private sector employment and wages in countries of high HIV prevalence. The case studies undertaken for CHGA and other research conducted over the past five years allow us to estimate the magnitude of the increase in labour costs resulting from HIV/AIDS. On average, this research indicates that HIV/AIDS increases the cost of labour to firms by 1 to 3%, making the Low Cost and Middle Cost columns of Tables 5.1-5.3 the relevant situations in most cases.

To translate these labour cost increases into changes in private sector employment levels, however, requires that we have detailed information on labour market conditions for the relevant firms or sectors under consideration. Unfortunately, almost no information on labour demand elasticities is available for sub-Saharan Africa, or even from other developing regions at a similar level of GDP/capita. Estimates of supply elasticities for skilled workers are also not available. We have therefore used only very general estimates based on a range of possible conditions and drawn from average conditions in OECD countries.27

Unskilled labour

There is a pool of unemployed, unskilled labour available at some fixed minimum wage in most African countries where HIV prevalence is high. There are thus no constraints on the supply of unskilled labour to firms, and wages for unskilled workers are not likely to be affected by HIV/AIDS. In this case, any additional costs to companies of employing labour from HIV/AIDS will reduce demand for labour and, as a result, firms will hire fewer workers. How many fewer depends on the responsiveness of labour demand to labour costs, which in the models is represented by the labour demand elasticity with respect to wages. While we do not have evidence from developing countries to confirm this, available information suggests that labour demand elasticities for unskilled workers are inelastic, so that a 1-percent increase in labour costs reduces employment by less than 1%. As a result, the percentage reduction in employment is likely to be less than the corresponding percentage increase in costs caused by HIV/AIDS (i.e., less than a 1 to 3% decline in employment).

In the Kenya case study presented here, AIDS increased the cost of permanent unskilled labour and casual unskilled labour to a large commercial agriculture firm by 1.8% and 0.7%, respectively. The analysis above suggests that AIDS probably reduced employment of permanent unskilled labour by this company by less than 1.8% and likely affected hiring of casual workers very little, if at all.

Skilled labour

Unlike for unskilled labour, the supply of skilled labour in the countries of interest is likely to be severely constrained in the short run, although national and regional labour migration in certain countries suggests that the skilled labour supply may be less constrained than is indicated by local labour market conditions. Because of this, when HIV/AIDS reduces the supply of skilled workers available to the private sector, private sector employment of skilled workers inevitably falls. Wages for skilled workers may increase or decrease, depending on whether the reduction in supply of these workers outweighs the HIV/AIDS-related increase in the cost of labour, or vice versa.
The Kenya case study presented here found that a commercial agriculture firm in Kenya is experiencing a 3.1% AIDS-related increase in the cost of skilled labour. In this case, in the short run, when labour demand is fairly unresponsive to wages, wages are likely to rise by about 1.5% and employment to fall by 2.3%. In the longer run, it is reasonable to assume that labour demand is more responsive to wages. In this case, wages could fall slightly (-0.8%), and the decline in employment could be steeper—in the range of 3.4%.
CHAPTER 6.
POLICY IMPLICATIONS AND CONCLUSIONS

The case studies and analysis presented in this report were intended to answer four research questions. In this concluding chapter, we summarize the responses that can be drawn from the study.

1. What are the costs of HIV/AIDS in the workforce to large and small private sector employers?

2. Are the strategies currently being pursued by private sector employers appropriate and sufficient, given existing knowledge about the effectiveness of workplace interventions?

3. What is the likely impact of AIDS on the level of private sector employment?

4. What are the implications of the answers to the first three research questions for government policy with regard to the private sector?

What are the costs of HIV/AIDS in the workforce to large and small private sector employers?

- For commercial agriculture companies in Kenya and Zambia, both large and small, the costs of AIDS in the workforce appear to be modest. Company K and Company Z faced costs equal to 1.4% and 1.7% of annual salaries, respectively. While we do not have enough information to make the same quantitative estimate for the small companies surveyed, it is safe to assume that their costs are lower than those of the large companies. The reasons for these low costs reflect in part the nature of commercial agriculture: largely unskilled, and thus easily replaceable, labour; heavy reliance on casual or seasonal workers who receive few benefits and do not have to be retained if their productivity declines; and little investment in training. The cost to these companies of losing a skilled worker or manager is higher, but each company faces relatively few such losses per year. In addition, in both large companies and likely some of the small ones, at least a few employees are already accessing antiretroviral therapy, and thereby forestalling many of the costs associated with untreated AIDS.

- For the tourism sector in Zambia, the situation is somewhat different. Costs to large and small companies, and to the government agency studied, appear to be considerably higher than for other sectors we have studied in South Africa, Uganda, Kenya, and Zambia. This can be explained by the relatively high skill level of tourism sector workforces, generous benefits provided by employers, and large investments in training. As in commercial agriculture, however, some costs are mitigated by use of non-permanent workers. It appears that the large company we studied is escaping many of the costs of AIDS because its employees have access to—and are accepting—antiretroviral therapy. The government agency, in contrast, is incurring very high costs.
Are the strategies currently being pursued by private sector employers appropriate and sufficient, given existing knowledge about the effectiveness of workplace interventions?

- Responses to AIDS by the companies studied varied widely. Company K has a well-established, active HIV prevention programme. The small companies in the same district, however, have done very little. Company Z takes advantage of activities offered by its main business association, the Zambia Export Growers Association, but has not yet gone beyond these offerings. Most of the small commercial agriculture companies surveyed in Zambia have engaged in at least one HIV-related activity, implying that many companies are aware of the need for workplace activities and willing to spend some money on them. A similar level of response prevails among the tourism companies: some history of implementing HIV-related activities, but an apparently low level of commitment and investment.

- Most of the companies studied are benefiting to some degree from services provided by NGOs, private providers, or public clinics and paid for by donors or government. The very active treatment programme at Company K is funded largely by an international donor. Treatment of the tourism company’s employees is paid for either by the employees themselves or by the government. Many of the small companies surveyed reported that their HIV-related activities were implemented at no cost, in most cases indicating NGO involvement.

- HIV prevention has many attributes of a public good, and it is difficult for a private sector employer to capture the benefits of investments in prevention activities. This is the reason that most prevention campaigns are, and will continue to be, sponsored by governments and NGOs. With the possible exception of Company K, which is already doing most of what comprises a comprehensive workplace HIV programme, all of the companies studied could be encouraged to undertake more active HIV prevention campaigns. Major investment in prevention by the companies, however, should not be expected.

- In contrast to HIV prevention, treatment of AIDS generates immediate benefits to an employer, as well to the employee and his or her family and community. The “net benefits of treatment” analysis conducted for the three large companies and the government agency studied makes clear that in most cases, treatment of employees with antiretroviral therapy will be a good investment for employers. For skilled workers and managers, the calculus is clear: treatment saves money. For unskilled workers in the commercial agriculture sector, the costs of untreated AIDS are too low to generate a financial benefit from paying for treatment. Even for these workers, however, the savings associated with lower absenteeism and higher productivity will offset a large proportion of the costs of treatment.

- The effectiveness of workplace HIV/AIDS interventions in offsetting the costs of AIDS to employers remains almost entirely unmeasured. While some evidence is accumulating on the impact of treatment on productivity, virtually nothing is known about the impact of workplace HIV prevention activities, such as the training of peer educators. In the absence of such information, it is difficult, and perhaps unwise, to demand that employers invest large amounts in HIV prevention. A responsible business manager would not invest in a new piece of equipment for which nothing is known about performance, durability, and operating costs. On a strictly financial basis, investments in HIV
prevention are equally uncertain. Rigorous evaluation of workplace interventions are urgently needed if a case is to be made for greater private sector investment.

*What is the likely impact of AIDS on the level of private sector employment?*

- There is a pool of unemployed, unskilled labour available at some fixed minimum wage in most African countries where HIV prevalence is high. There are thus no constraints on the supply of unskilled labour to firms, and wages for unskilled workers are not likely to be affected by HIV/AIDS. In this case, any additional labour costs to companies from HIV/AIDS will reduce demand for labour and, as a result, firms will hire fewer workers. How many fewer depends on the responsiveness of labour demand to labour costs. While we do not have evidence from developing countries to confirm this, available information suggests that labour demand elasticities for unskilled workers are inelastic, so that a 1-percent increase in labour costs reduces employment by less than 1%. As a result, the percentage reduction in employment is likely to be less than the corresponding percentage increase in costs caused by HIV/AIDS. We thus expect HIV/AIDS to have relatively little impact on the overall level of unskilled employment. In cases where AIDS does significantly raise the cost of unskilled labour and demand for labour is highly responsive to wages, however, employment could fall by several percentage points.

- Unlike for unskilled labour, the supply of skilled labour in the countries of interest is likely to be severely constrained in the short run, although national and regional labour migration in certain countries suggests that the skilled labour supply may be less constrained than is indicated by local labour market conditions. Because of this, when HIV/AIDS reduces the supply of skilled workers available to the private sector, private sector employment of skilled workers inevitably falls. Wages for skilled workers may increase or decrease, depending on whether the reduction in supply of these workers outweighs the HIV/AIDS-related increase in the cost of labour, or vice versa.

- In the Kenya case study presented here, AIDS increased the cost of permanent unskilled labour and casual unskilled labour to Company K by 1.8% and 0.7%, respectively. The analysis suggests that AIDS may have reduced employment of permanent unskilled labour by this company by less than 1.8% and likely affected hiring of casual workers very little, if at all. AIDS increased the cost of skilled labour by 3.1%, however. In the short run, when labour demand is fairly unresponsive to wages, wages may have risen by about 1.5% and employment fallen by 2.3%. In the longer run, wages may fall slightly (-0.8%), and the decline in employment could be steeper—in the range of 3.4%.

*What are the implications of the answers to the first three research questions for government policy with regard to the private sector?*

The individual country reports offer specific recommendations for large and small companies in each of the countries and sectors studied. Here we offer a few general conclusions about how governments might translate the results of this analysis into policy.

- All of the case studies and the analysis of employment levels draw a sharp distinction between skilled and unskilled labour. In most countries and most industries, skilled labour is expensive and scarce; unskilled labour is plentiful and cheap. Employers of all sizes appear to have an incentive to invest a considerable amount in the health and retention of skilled employees, including the provision of antiretroviral therapy for
HIV/AIDS. Depending on employee benefits and other employment policies, some employers, such as multinationals and those in high technology industries, will also find it financially advantageous to provide HIV/AIDS prevention and treatment to permanent unskilled staff. Few if any companies will see financial reasons to do so for non-permanent workers. Better information about the costs of untreated AIDS among skilled workers and the availability of treatment may encourage more employers to subsidize the cost of treatment for skilled employees and managers. At the same time, governments should not expect most companies to pay for services for unskilled and non-permanent workers voluntarily. Although formally employed, these individuals will likely utilize public sector services.

- Few small companies regard HIV/AIDS as a high priority business concern. Most have seen little or no impact of the disease on their companies, and all face other problems and challenges that they consider to be much more important. At the same time, many have implemented some workplace activities, and others indicate that they would do so if there were greater demand and/or the cost were lower. Although there are so far few examples of successful collective action, it appears that the most promising way to engage small companies in this issue is through their business associations. The Zambia Export Growers Association is delivering HIV prevention interventions to its members; the Livingstone Tourism Association could potentially mobilized to do the same. Rather than attempting to engage small companies directly, governments may be better served by assisting business associations.

- Opportunities for partnerships between private companies and NGOs and government agencies for the delivery of HIV/AIDS services appear to abound. Although HIV prevention is primarily a public sector and household responsibility, formal sector employers offer one important advantage: a concentrated population made up primarily of men, who are typically difficult to reach with health education and interventions. Some companies also have health-related infrastructure (clinics, training facilities, transport) that could be utilized by a larger population than solely their own workforces, if there were reason to do so. The public sector and NGOs, for their part, often have access to lower prices for drugs, other medical supplies, expertise, and laboratory testing. There are various ways in which partnerships could leverage resources from both sides. Company K’s AIDS treatment programme is an example of one such partnership: the company provides clinic infrastructure, transport, and some personnel and extends access to treatment to employees’ families; a donor-funded programme pays for drugs, training, additional personnel, and other costs. Another possibility is for governments to accredit and supply private companies’ clinics, in return for providing services to a designated broader community. Successful partnerships can be challenging to achieve and sustain, but the private sector does offer opportunities.

- The impact of AIDS on levels of employment by the private sector is likely to be modest, in the range of a few percentage points at most. Despite this, since maximizing private sector employment is a goal of many governments, in some cases governments may wish to take action to reduce AIDS-related job losses. Since these losses result primarily from an increase in the cost of labour, reducing the non-wage costs of labour to employers is one possible solution. Provision of treatment by the public sector may have this effect, as may restraint in legislated requirements for employee benefits.
Finaly, an argument can be made for governments to target AIDS treatment resources to skilled workers throughout the economy. Although rationing of ART is a sensitive political and social issue, it is an economic necessity in most if not all countries in Africa. The contribution of skilled workers—whether machine operators, teachers, truck drivers, or accountants—to national economic growth, and the scarcity of such workers throughout the region suggest that giving such individuals priority in allocating treatment resources would be a responsible policy decision.28
REFERENCES

   http://www.teaboard.or.ke/statistics.asp.