



HIV/AIDS in the Commercial Agriculture Sector in Zambia: Impact and Responses

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EXECUTIVE SUMMARY

Introduction

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 HIV epidemic in order to support social and economic development and foster good governance. Among the issues CHGA was asked to consider was the impact of HIV/AIDS on Africa's private sector and the policy challenges this impact creates for both businesses and governments.

Previous research has shown that HIV/AIDS is raising the cost of labour and worsening the already severe shortage of skilled staff that constrains business growth in many areas. Given the critical role of the private sector in generating and sustaining employment and social and economic development in many countries in the region, it is important to help businesses remain profitable and globally competitive despite the costs of HIV/AIDS. At the same time, businesses have been called on to contribute more actively to national HIV/AIDS efforts. The rationale for businesses to invest more in HIV/AIDS programs and the effectiveness of these programs remain uncertain, however, and many firms are instead taking steps to avoid the costs of the epidemic by shifting them onto governments, households, and NGOs.

A prerequisite for improving government policies and business practices is accurate information about the extent and impact of the epidemic on the private sector and existing private sector responses to it. This report provides such information for one important industrial sector in Zambia, that of commercial agriculture. 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.²² This 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.

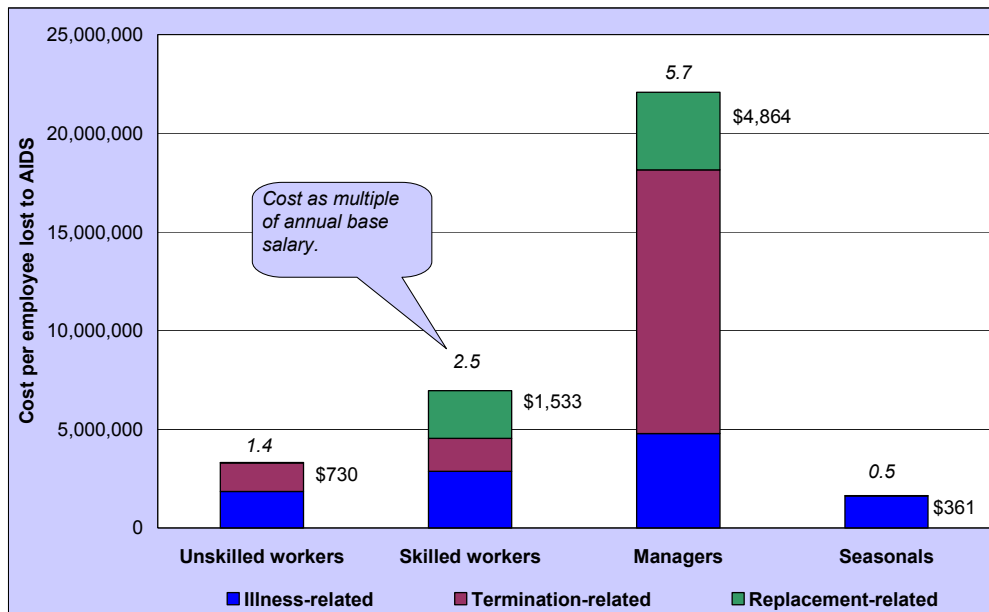
Using detailed human resource data, we estimated the costs of HIV/AIDS to a large commercial farm in Central Province and modelled the potential net benefits of a treatment intervention. (To protect the identity of the participating company, we will refer to it in this report as "Company Z.") We also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

Results 1: Large Company

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 S1. The numbers above the columns show the total cost per termination as a multiple of the average annual salary in that job band.

Figure S1: Cost per AIDS-related termination

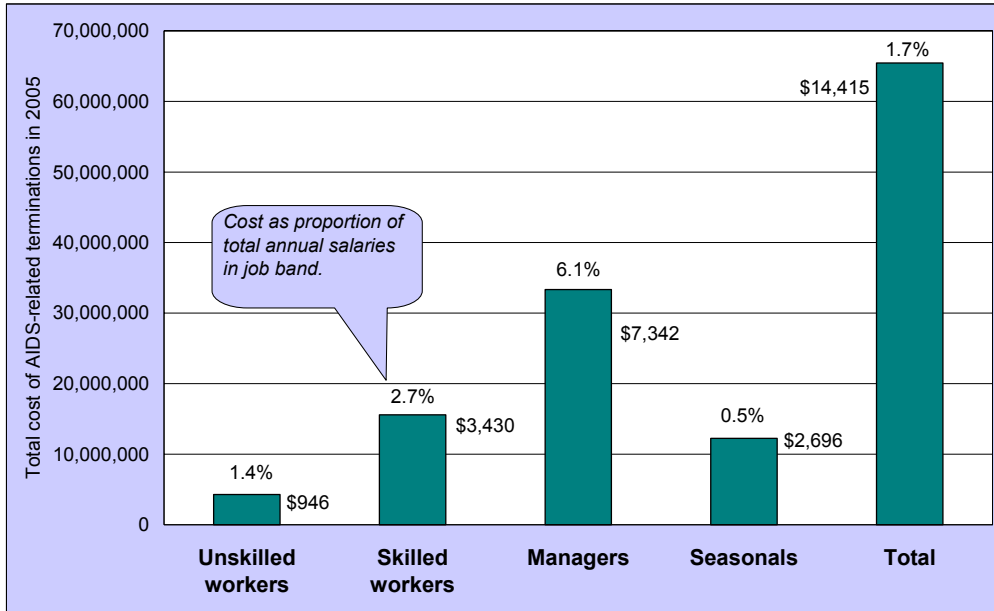


For skilled workers, diminished productivity when at work is the single largest cost, accounting for roughly a quarter of the total. For managers, the very large group life benefit accounts for more than half of the total.

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.

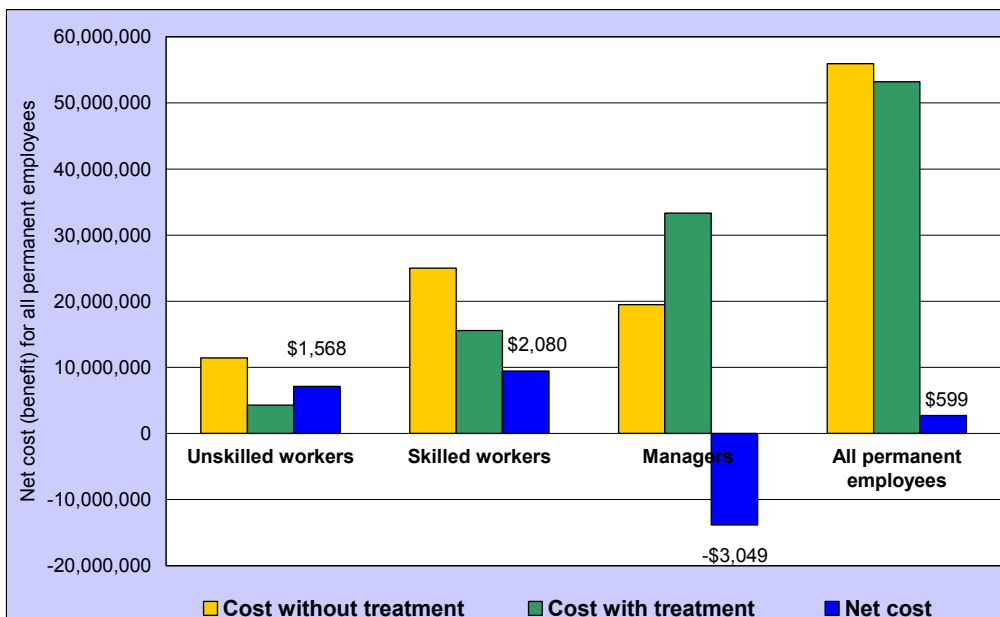
Based on actual rather than estimated mortality, the total cost of HIV/AIDS to Company Z in 2005 is shown in Figure S2. The numbers over the columns in Figure S2 represent the total cost of AIDS-related terminations in the job band as a percentage of the total base salary bill for that job band.

Figure S2: Total cost of all AIDS-related terminations in 2005



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 S3.

Figure S3: 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.

Results 2: Small Companies

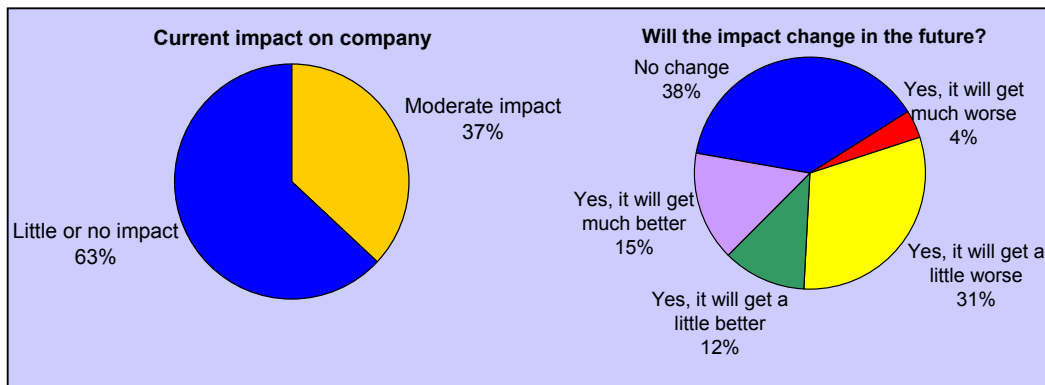
Of the 29 companies surveyed, most were engaged primarily in supplying agricultural inputs (38%), commercial farming (28%), or processing agricultural outputs (24%). The surveyed companies jointly employed a total of 2,566 permanent and 1,816 casual workers. The average workforce size was 89 permanent 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 S4. 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.

Figure S4: Managers' views of the current and future impact of HIV/AIDS on their companies

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.

Conclusions

- 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.

- 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.

CHAPTER 1. INTRODUCTION

a. Rationale 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 HIV epidemic in order to support social and economic development and foster good governance. Among the issues CHGA was asked to consider was the impact of HIV/AIDS on Africa's private sector and the policy challenges this impact creates for both businesses and governments.

The appropriate role of the private sector in fighting the HIV/AIDS epidemic in sub-Saharan Africa is hotly debated. HIV/AIDS is raising the cost of labour and worsening the already severe shortage of skilled staff that constrains business growth in many areas. 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.

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 avoid the costs of the epidemic by shifting them onto governments, households, and NGOs.

As the epidemic matures, it is becoming increasingly important for governments to adopt policies that achieve a socially desirable sharing of the economic burden of HIV/AIDS among the private, public, and household sectors. A prerequisite for identifying such policies and for improving business practices is accurate information about the extent and impact of the epidemic on the private sector and existing private sector responses to it. The purpose of this report is to provide such information for one important industrial sector in Zambia, that of commercial agriculture. Specifically, the report aims to answer the following three research questions:

1. What are the current costs of HIV/AIDS to large and small commercial agriculture companies in Zambia?
2. How are commercial agriculture companies in Zambia responding to the epidemic?
3. Are the strategies currently being pursued by these companies appropriate to the circumstances of the commercial agriculture sector in Zambia?

To answer these questions, we collected detailed human resource, medical, and financial data from one very large commercial agriculture firm and a sample of small and medium-sized commercial agriculture companies in Central Province. Our methodology focused on generating quantitative estimates of current impacts, costs, and responses. The large company produces both high-value crops for export and staple food crops for domestic consumption. The small companies were sampled from Lusaka District and are primarily input suppliers (11), commercial farmers (8) or product processors (7). Although the data are drawn from only one province, many of the findings are likely to be widely applicable to commercial agriculture in the country.

This report is structured as follows. In the remainder of this section, we first briefly review what is known about the impact of HIV/AIDS on commercial agriculture, and on the private sector in general, in sub-Saharan Africa. We then describe our overall approach to the analysis. In Section 2, the methods and results for the large company analysis are presented, while Section 3 does the same for the small company survey. Section 4 offers conclusions and recommendations.

b. Background

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%.¹ Case studies in the mid-1990s reported low costs to businesses in Zambia,² Malawi,³ and Botswana.⁴ A 2002 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.⁵ 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.⁶ 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.⁷

Estimates of the costs of HIV/AIDS 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."^{8,9} Several of the reports mentioned above found changes in absenteeism among HIV-positive workers.^{1,4,10} 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.⁶

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.¹¹ A survey of companies in South Africa in 2004 found tremendous variation among firms in terms of their exposure to HIV/AIDS cost risks.¹² 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 companies

Variable	Example
Industrial sector	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. ^{12;13}
Size of company	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. ¹³
Job level of employees affected	Morbidity and mortality among more skilled (and higher paid) employees impose higher costs on employers than they do among less skilled employees. ¹⁴
Company ownership (current or historical)	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. ^{11;14}
Population HIV prevalence	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% ¹⁴ ; in Zambia, prevalence among managers at three companies was found to be just one fifth of that among unskilled workers. ¹⁵

One industrial sector for which concerns about the potential impact of HIV/AIDS have been raised is commercial agriculture. 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.^{2;16;17} 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.¹⁸ The research that led to these productivity loss estimates provided the basis for the large company case study in this report.

c. 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 1.1 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

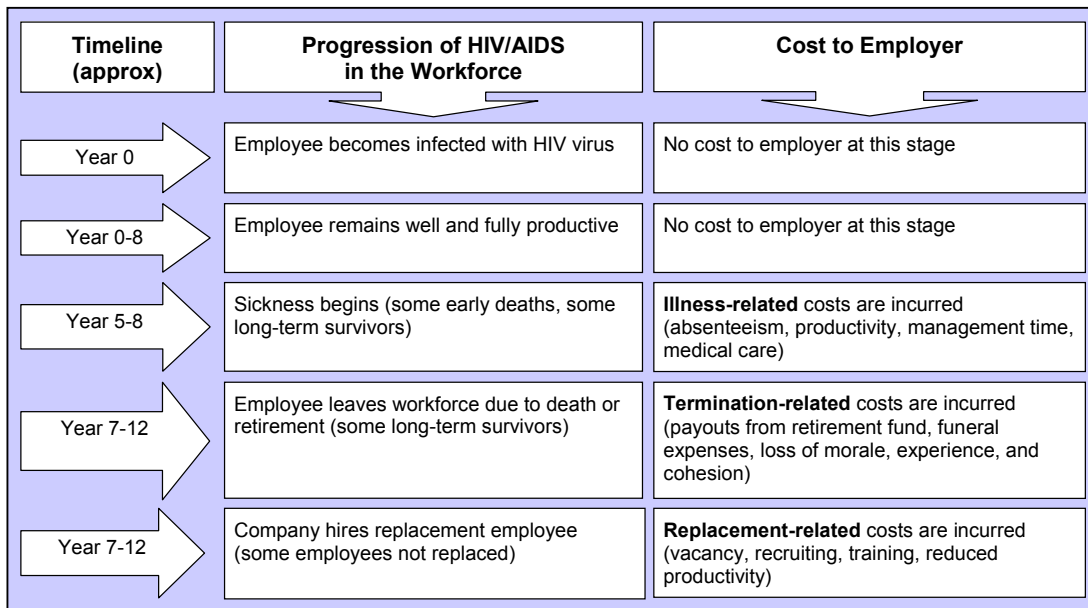
	a. Increased expenses (Direct costs)	b. Lost productivity (Indirect costs)
I. From one employee with HIV/AIDS (individual costs)	<ul style="list-style-type: none"> • Benefits payments • Medical care • Recruitment of a replacement worker • Training of a replacement worker 	<ul style="list-style-type: none"> • Increased leave and absenteeism • Reduced on-the-job productivity • Supervisor's time • Vacancy until replacement is hired • Poorer performance due to replacement's inexperience
II. From many employees with HIV/AIDS (organizational costs)	<ul style="list-style-type: none"> • Benefits premiums • Accidents due to sick or inexperienced employees • Litigation over benefits, dismissals, etc. 	<ul style="list-style-type: none"> • Production disruptions due to missing skills, accidents, vacant positions, etc. • Loss of institutional memory and experience • Breakdown of workforce morale and cohesion • Diversion of senior managers' time • Deteriorating labour relations
III. From high HIV prevalence in society (market or external costs)	<ul style="list-style-type: none"> • Higher cost of material inputs • More security needed due to breakdown in civil society • Higher wages due to shortage of skilled workers 	<ul style="list-style-type: none"> • Reduced demand for products or services • Higher risk premium on investment • Higher cost of capital • Higher cost of transactions with government and labour
Total Costs of HIV/AIDS		

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 1.2 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



d. The Study Site: Central Province, Zambia

The study took place in Central Province, with small companies selected from within Lusaka District. Farms and agricultural companies in Lusaka District 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. Fresh vegetables are the fourth largest agricultural commodity produced in Zambia and the country's fourth most important export, after cotton, sugar, and tobacco.¹⁹

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. Results for urban areas of Zambia, from which the companies in our study draw their workforces, are shown in Table 1.2

Table 1.2: HIV prevalence in urban areas of Zambia by age and sex

Age group	Males	Females	All
15-19	2.4%	9.0%	6.5%
20-24	4.9%	22.7%	14.8%
25-29	24.0%	38.4%	32.1%
30-34	34.3%	42.5%	38.2%
35-39	33.9%	40.2%	36.6%
40-44	27.2%	29.4%	28.4%
45-49	29.4%	20.1%	24.4%
Total 15-49	19.2%	26.3%	23.1%

Source: Zambia Demographic and Health Survey 2001-2002²⁰

CHAPTER 2.

THE COSTS OF HIV/AIDS TO A LARGE COMMERCIAL AGRICULTURE FIRM

Using detailed human resource, financial, and medical data, we estimated the costs of HIV/AIDS to one large commercial agriculture company 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.”

a. Methods

For each Company Z employee who died in service or was retired on disability due to HIV/AIDS in the years prior to the study, we estimated the costs that Company Z incurred while the employee was ill, when he or she died or retired, and while a replacement was being hired and trained. We then multiplied the cost to Company Z for losing an employee to HIV/AIDS by the estimated number of employees who terminated due to AIDS in 2005, the baseline year for the analysis. Cost and mortality estimates were stratified by job level, and mortality estimates were also stratified by age group.

The analysis incorporated data from five sources.

1. Data on the demographic characteristics of the workforce were obtained from the company’s payroll database. The payroll database also contained records of individual employees’ attendance at work, which allowed us to estimate changes in absenteeism associated with HIV/AIDS.
2. We interviewed company managers to obtain estimates of specific personnel-related costs, such as employee benefits, recruiting, training.
3. To estimate the prevalence of HIV infection in the Company Z workforce, we used the results of the 2001-02 Zambia Health and Demographic Survey (DHS).²⁰
4. Where necessary we relied on published sources to find reasonable values for variables that could not be estimated from the primary data available.

The methodology for this analysis is described in detail in previously published journal articles that are available from the authors.^{6,18} The methodology relies in part on a comparison of employees who died in service of natural causes with employees who are still in the workforce. The number of deaths in service at Company Z in the past three years is small: our analysis is based partly on comparing the experience of just 11 permanent employees who died in service and for whom we had data with that of the current permanent workforce population of 469. We also cannot be certain of the causes of death for those who died in service. Mortality data for Zambia as a whole, however, suggest that the majority of natural cause deaths among working-aged adults are AIDS-related

b. Description of Workforce

In 2005, when data for the study were collected, Company Z had more than 450 permanent employees and nearly 800 seasonal workers. The vast majority of both permanent and seasonal workers were employed as manual labourers who pick and pack the company's produce. Two thirds of permanent employees are male, but among seasonal workers, almost two thirds are female. The composition of the workforce by job level is shown in Table 2.1. (In addition to the permanent and seasonal staff shown, there are several hundred casual workers, who usually work for periods of 6 months but can be laid off at will, as labour demand on the farm determines.)

Table 2.1: Composition of Company Z workforce by job level

Job band	Annual compensation*	Number in band	% of workforce
Unskilled workers	< ZMK 3 million	126	10%
Skilled workers	ZMK 3-6 million	203	16%
Managers	> 6 million	140	11%
Seasonal workers	n.a. (6 month contracts)	776	62%
Total	n.a.	1,245	100%
Casual workers	n.a.	500+	n.a.

*Includes annual base salary + allowances

c. Unit cost estimates

We estimated nine types of unit costs incurred when Company Z loses an employee to HIV/AIDS or another chronic (long-term) illness.

- Illness-related costs: (1) Leave and absenteeism; (2) On-the-job productivity loss due to illness; (3) Medical care; (4) Supervisors' time.
- Termination-related costs: (5) End-of-service benefits.
- Replacement-related costs: (6) Vacancies; (7) Recruitment of replacements for employees lost to illness; (8) Training of replacements; (9) Productivity loss due to new employees' inexperience.

Table 2.2 explains how we estimated each of these costs and summarizes what we found. An exchange rate of ZMK 4,540=\$1, the average rate in 2005, is used throughout this report.*

* Note that the Zambian Kwacha appreciated dramatically at the end of 2005. As of February 1, 2005, the exchange rate was ZMK 3,200=\$1.

Table 2.2: Unit cost estimates for Company Z

Type of cost	How we estimated it	What we found
Leave and absenteeism	We used the company's attendance records to compare the amount of leave of all types taken by employees who died in service of natural causes to the amount of leave taken by all other employees.	Current employees took an average of 11 days of paid leave per year. Employees who died in service of natural causes took 44 days in their last year of service (an increase of 33 days) and 27 days in their second to last year of service (an increase of 16 days).
On-the-job productivity loss	Employees are thought to have reduced productivity during the advanced stages of HIV/AIDS. As there was not any detailed data on individual productivity from Company Z, the productivity losses experienced from a commercial agriculture firm in Kenya were used.	The average reduction in on-the-job productivity associated with HIV/AIDS was 27 percent in the last year of service and 19 percent in the second-to-last year. These reductions in productivity pertain only to days on which the employee was present at work (not absent or on leave, as this is counted separately).
Medical care	The company provides first aid and occupational healthcare at two on-site clinics. These clinics are not equipped to treat HIV/AIDS-related conditions, however. Employees in Bands 1 and 2 may be assisted with transport to a referral clinic if needed. Senior Band 3 employees belong to a medical aid scheme paid for by the company and can claim reimbursement for medications up to ZMK 50,000 per family per month. In addition, Company Z currently pays directly for antiretroviral therapy for several of its senior employees.	Company Z spends approximately \$1,200 per month on pharmaceuticals for its on-site clinics, but the proportion of this attributable to HIV/AIDS is not known, nor do we have data on transport costs or the number of senior staff on ART at company expense. We therefore excluded these costs from the analysis. We also omitted productivity losses caused by time spent visiting either the on-site clinic or an off-site medical care provider.
Supervisor's time	Supervisors of employees with HIV/AIDS must generally spend some time taking care of the employee, adjusting other employees' schedules, and processing paperwork. We did not have any data on this cost for Company Z, so we used estimates from a commercial agriculture firm in Kenya.	Supervisors were estimated to spend 1 day for unskilled workers, 6.6 days for skilled workers and managers, and 0 days for seasonal workers.
End of service benefits	We used the company's employment contracts and information from the human resources manager to estimate the amount the company pays out in group life assurance benefits and funeral benefits each time an employee dies of an AIDS-related cause. This approach is explained in more detail in Box 2.1. All staff (permanent and non-permanent) also belong to the National Pension Scheme Authority, to which the company and the employee each contribute 5% of salary. There is no extra cost to the company for this benefit as a result of AIDS, however.	For Band 1 and Band 2, the company contributes ZMK 460,000 (\$101) for funeral costs and ZMK 1,000,000 (\$220) from the group life policy. Beneficiaries of staff in Band 3 receive ZMK 1,000,000 for funeral costs and a group life benefit equal to 3 times the annual base salary of the deceased employee. There are no costs incurred upon the death of a seasonal worker.

Type of cost	How we estimated it	What we found
Vacancy and interviews	The company's human resource manager estimated the average durations of vacancies at each job level and the number of days of managers' time needed for interviewing to fill a typical position.	Vacancies averaged 3 months for managers and 1 month for skilled workers; each vacancy required an average of 1 day of interviewing time from managers. Replacement of unskilled and seasonal workers is immediate, and no management time is needed for interviewing.
Recruitment of replacement worker	The human resources manager estimated the direct costs of recruiting a new employee at each level of the workforce. Direct costs include travel for interviews, search firms, application processing, medical exam, etc.	There are no direct costs to recruit new unskilled or seasonal workers. For skilled workers and managers, the average direct recruitment cost is ZMK 700,000 (\$154).
Training of replacement worker	The human resources manager estimated the direct costs of training a new employee at each level of the workforce. Direct costs include course tuition, room and board during training, etc.	There are no direct costs to train new unskilled or seasonal workers. For skilled workers and managers, the average direct cost of training is ZMK 908,000 (\$200).
Replacement inexperience	New employees who replace those lost to AIDS take some time to become fully productive. We did not have data on the duration of this "startup period" or how productive a new employee is during time, so we used parameters from a commercial agriculture firm in Kenya.	Unskilled and seasonal workers are considered to be fully productive immediately. It takes an average of 4 and 6 months for skilled workers and managers, respectively, to become fully productive, and they are expected to be 70% and 55% productive during this period. Another employee must also spend the equivalent of half a day providing on-the-job training for a new seasonal or unskilled worker, 1 week for a new skilled worker, and 2 weeks for a new manager.

In order to add up all these costs, we had to put a monetary value on lost time and productivity. We valued a day of lost time at the base daily salary or wage of the unproductive worker, adjusted by a "wage multiplier" that accounted for the cost of employee benefits. Wage multipliers used were 1.4 for unskilled workers, 1.8 for skilled workers, 2.2 for managers, and 1.0 for seasonal workers.

Box 2.1: Accounting for insured benefits in the Company Z analysis

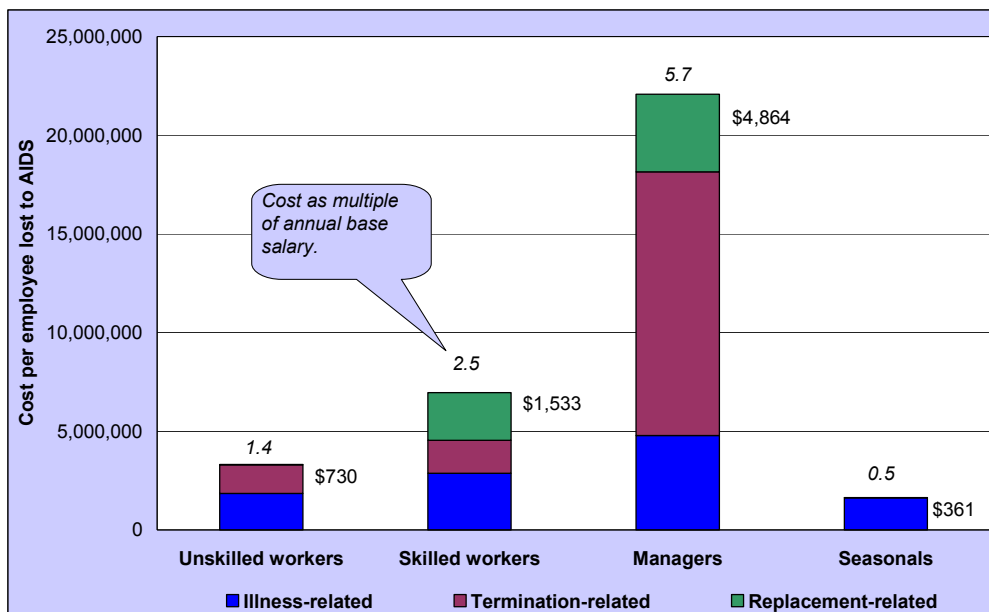
Many companies purchase life insurance and other employee benefits from outside insurance providers. The employer and the employee typically share the cost of the premiums for these benefits, and the insurance provider assumes the risk that the employee will make a claim for payment. Company Z purchases group life assurance from an outside provider.

AIDS is the leading cause of mortality among employed persons in Zambia, and claims for death and funeral benefits due to AIDS must account for a large share of the total cost of group life benefits. We have incorporated this cost into our analysis by assuming that there is a direct relationship between contributions in the current period and claims for benefits in the period before. It is very likely that the total cost of group life benefits includes an estimate of death benefits that will be claimed by Company Z employees in the current period, based on historical experience and whatever modelling of expected mortality the insurer undertakes. Under this assumption, each additional claim for benefits made this year, whether due to AIDS or any other cause of death in service, will be reflected in the cost of the benefits to Company Z, either this year or next year.

The main drawback to this approach is that it does not capture the role of insurance markets in smoothing costs over time or spreading risks over larger populations. This could result in over-estimating or under-estimating the cost to a specific employer at any given time. Despite this drawback, we believe that it is sufficiently accurate for this analysis, and we have used it to project the impact of a death in service on Company Z's group life assurance costs.

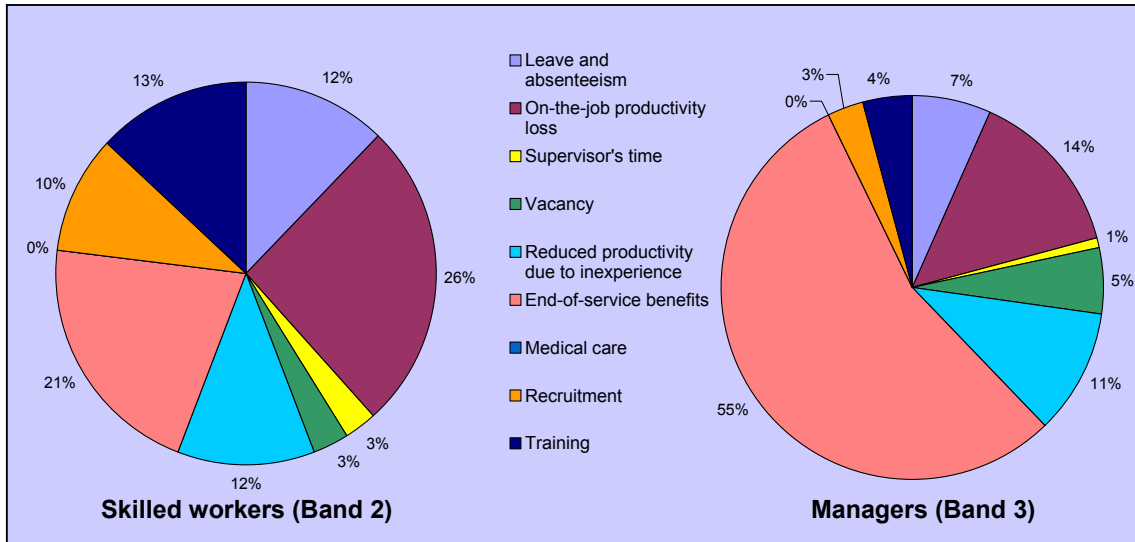
The total cost to Company Z per employee lost to AIDS is shown in Figure 2.1. The numbers above the columns show the total cost per termination as a multiple of the average annual salary in that job band. For skilled workers, for example, the cost of each AIDS-related termination is approximately ZMK 7 million (\$1,533), which is roughly 2.5 times the annual salary of a skilled worker; for managers, the total amount is three times larger (ZMK 21 million, \$4,692) and is equivalent to more than 5 years' annual salary.

Figure 2.1: Cost per AIDS-related termination



The distribution of the costs shown in Figure 2.1 varies across the job bands, as illustrated in Figure 2.2.

Figure 2.2: Distribution of costs per termination, skilled workers and managers



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.

d. Loss of Employees to AIDS

Up to this point, all the cost estimates we have made pertain to the death of a single employee due to HIV/AIDS. In order to extrapolate these costs to Company Z as a whole, we must estimate how many employees are likely to die of AIDS-related causes in a given year, in the absence of antiretroviral therapy. To do this, we applied the urban adult prevalence of HIV infection from the 2001-2002 Zambia DHS, as presented in Table 1.2 earlier in this report. After adjusting for the age and gender structure of Company Z's workforce, we estimated the prevalence of HIV in Company Z's workforce shown in Table 2.3.

Table 2.3: Estimated prevalence of HIV infection in Company Z's workforce

Job band	Estimated HIV prevalence
Unskilled workers (Band 1)	28.8%
Skilled workers (Band 2)	30.9%
Managers (Band 3)	30.2%
Seasonal workers (Band 4)	27.0%
Entire workforce	28.5%

Finally, we assumed that approximately 10 percent of HIV-positive individuals in a typical population will die of AIDS-related causes in any given year, in the absence of antiretroviral therapy and assuming a 9-10 year average interval between infection and death. The result was the estimate of AIDS-related terminations at Company Z in 2005 shown in Table 2.4(a).

Table 2.4: Expected and adjusted number of AIDS-related terminations in 2005

Job band	a. Expected number of AIDS-related terminations in 2005
Unskilled workers (Band 1)	4
Skilled workers (Band 2)	6
Managers (Band 3)	4
Seasonal workers (Band 4)	21
Entire workforce	35
Job band	b. Adjusted number of AIDS-related terminations in 2005
Unskilled workers (Band 1)	1
Skilled workers (Band 2)	2
Managers (Band 3)	2
Seasonal workers (Band 4)	8
Entire workforce	13

On average, AIDS would have been expected to cause the loss of 35 permanent and seasonal employees per year, including 14 deaths among permanent staff. Actual mortality in the workforce, however, has been much lower than this. The company has been experiencing only about 5 deaths of permanent staff per year for the past four years, fewer than half of those expected.

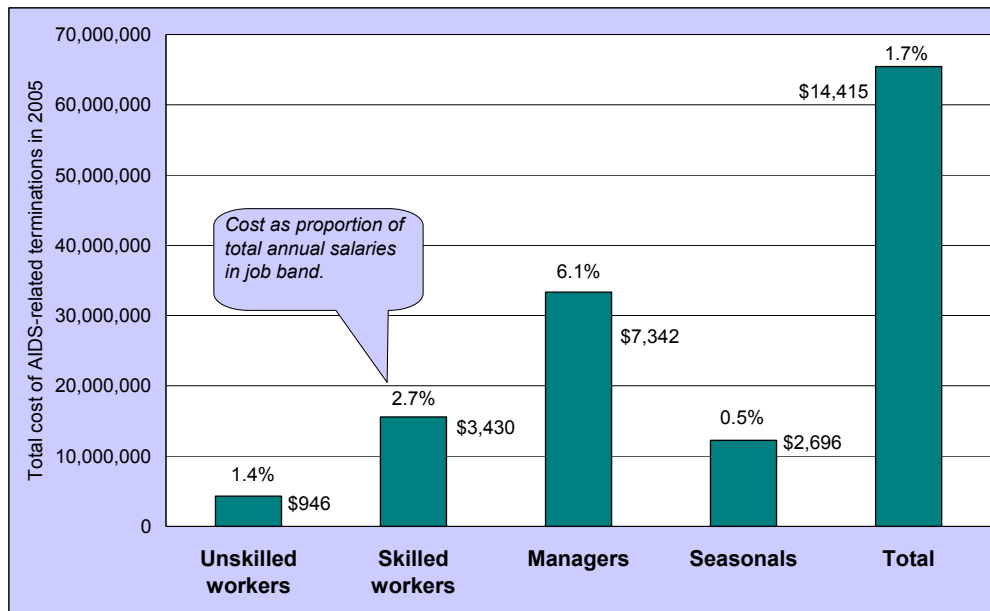
The explanation for the low observed mortality among seasonal staff is straightforward: seasonal workers are hired on 6-month contracts which are renewed based on performance. A seasonal worker who is chronically ill is unlikely to meet minimum performance standards and will thus not be retained. Company Z will still incur morbidity-related costs (leave, lower productivity) for this person but will avoid mortality-related costs.

For permanent staff, the discrepancy between estimated and observed mortality is not as easy to explain. There are three possibilities. First, HIV prevalence in this population may be lower than estimated, leading to lower AIDS-related mortality. Second, at least some of these employees are already on antiretroviral therapy. ART has been available in public health clinics in Zambia for only about one year, but private providers have offered it for several years. Some Company Z managers, and possibly a few lower level workers, have taken advantage of this, 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.

We do not have the data required to determine which explanation is correct. Instead, we will model the costs of AIDS to Company Z based on actual mortality, with the proviso that costs would be substantially higher should mortality rise to expected levels. The adjusted number of AIDS-related terminations per year is shown in Table 2.4 (b).

e. Aggregate Cost to Company Z

To arrive at the total cost of AIDS-related losses to the company, we multiplied the cost per termination by the adjusted number of terminations expected in each job band, as shown in Table 2.4b. The results are shown in Figure 2.3. The numbers over the columns in Figure 2.3 represent the total cost of AIDS-related terminations in the job band as a percentage of the total base salary bill for that job band. For skilled workers, for example, the total cost of AIDS-related terminations in 2005 was equivalent to 2.7% of skilled workers' salaries that year.

Figure 2.3: Total cost of AIDS-related terminations in 2005

On average, HIV/AIDS is increasing the cost of labour for Company Z by about 1.7 percent of annual salaries. As noted above, if the number of AIDS-related terminations were closer to the predicted number, the total cost to Company Z, would be more than twice as high.

f. Returns to Investments in Workplace Interventions

One purpose of a cost assessment is to help businesses and governments understand the potential benefits of spending more on HIV prevention and HIV/AIDS treatment. The costs we have estimated, which result from the illness, death, and replacement of an employee due to HIV/AIDS, can be avoided—or at least postponed—by effective prevention and treatment interventions.

The net benefits of preventing an HIV infection at any level of the workforce are the “avoided costs” of that infection, minus the cost of the prevention programme itself. Among skilled workers and management, for example, Company Z will ultimately save between ZMK 7 million and 22 million (\$1,540-\$4,864) for each employee who does not become HIV-positive, less the cost of the prevention intervention. These savings will occur several years into the future, of course.[†]

As the cost of antiretroviral drugs has fallen in the past two years, providing antiretroviral therapy to employees and dependents has become a viable option for many employers in sub-Saharan Africa. By providing enhanced care and antiretroviral therapy to HIV-positive employees, a company can reduce the illness-related costs of the disease (absenteeism, medical care, etc.) and push the termination-related costs (benefits, replacement) 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.

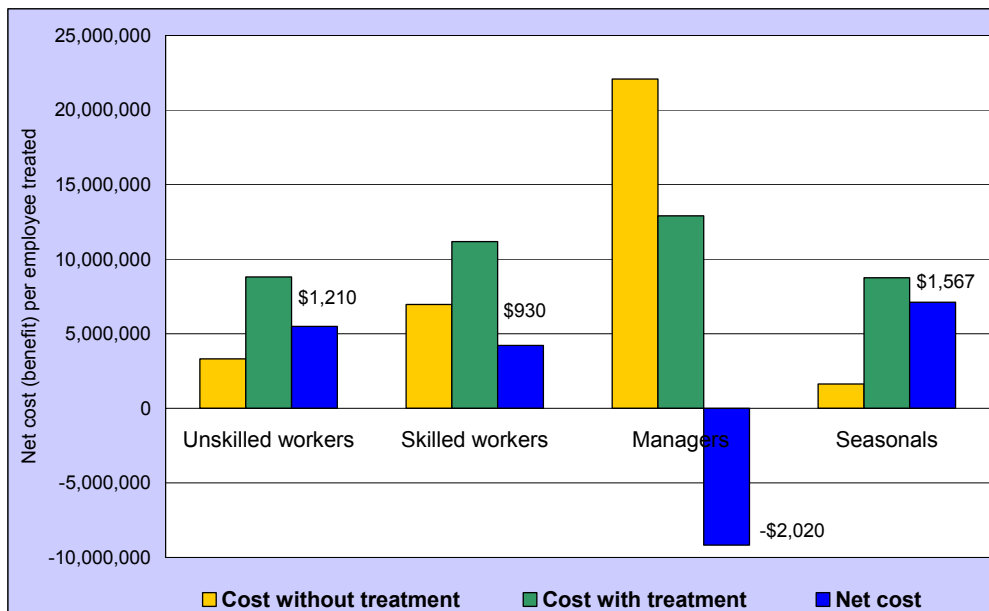
[†] Because the benefits of preventing an HIV infection now will only accrue 6-10 years from now, a positive discount rate should be applied in estimating the benefits and later-year costs of prevention.

To see what the benefits of such a program might be for Company Z, we calculated the net cost for a hypothetical treatment program. To simplify the analysis, we made a number of assumptions:

- Treatment begins 2 years before the employee would otherwise have been expected to die of AIDS-related causes, and employees who start treatment today will be able to remain in the workforce for an average of 5 years longer than would otherwise be expected. Treatment is thus required for a total of 7 years per eligible employee.
- After 5 years, treatment is assumed to fail, leading to a period of illness and then death. There will be some additional absenteeism and reduced productivity associated with initiating therapy, which we will arbitrarily assume to equal one quarter of that associated with untreated HIV/AIDS.
- Once treatment fails, employees can be retired for medical reasons immediately, eliminating the rest of the high absenteeism and low productivity that characterizes AIDS-related deaths now. Upon medical retirement, no further benefits are provided by the company.
- Because Company Z managers will have ample lead time to plan for AIDS-related attrition, the loss of productivity related to vacancies and to the inexperience of replacement employees will cost one quarter of what they do in the absence of treatment. Direct costs of recruitment and training remain the same.
- A 4.7% discount rate is applied to future treatment costs, in line with the real interest rate in Zambia in 2005.
- Treatment costs \$300/patient/year (ZMK 1,362,600). This is a lower-range but not unrealistic estimate of the annual variable costs (drugs, diagnostics, and clinic services) of ART in Lusaka.

Keeping in mind that this example is for illustrative purposes only, Figure 2.4 shows the net costs to Company Z per employee treated by our hypothetical treatment program.

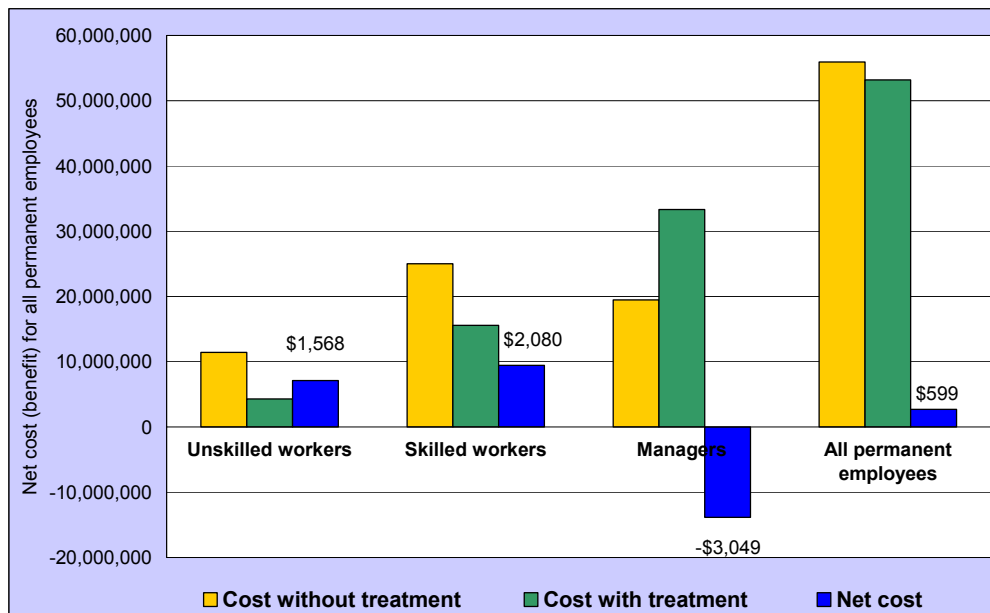
Figure 2.4: Net costs per employee treated



The net amounts shown in Figure 2.4 are the difference between the “treatment” and “no treatment” scenario for each employee who is treated, at a treatment cost of \$300 per year and under the (admittedly rather strict) conditions of our hypothetical program. For unskilled and skilled workers, the financial benefits of treatment partly offset the costs. For managers, treatment is highly “profitable,” saving the company more than ZMK 9 million (\$2,020) per employee treated.

If all 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—for the permanent workforce, as shown in Figure 2.5.

Figure 2.5: Net costs of treatment for full permanent workforce



Company Z is located near a public clinic that is expected to begin providing ART to its patients by the end of 2006. Although some employees will continue to prefer a private provider, most will not be able to afford private care. One intervention that would result in net savings for Company Z might therefore be for the company to undertake the support activities needed to ensure that HIV-positive employees enrol in a treatment programme and adhere to their medication, such as on-site testing and counselling for employees and families and provision of free transport to the clinic on a regular basis. The company may also be able to use its own, on-site clinics as down-referral facilities that can monitor employees who are on ART once they have been stabilized by the public clinic or a private provider.

Beyond the potential financial benefits to Company Z, investing in treatment and care:

- Buys time for drug and diagnostic prices to fall, for medical and social science researchers to develop new treatments, and for public infrastructure for treating HIV/AIDS to be expanded.
- Reduces the time managers must spend coping with employee deaths and turnover.
- Reduces the impact of HIV/AIDS on workforce morale, motivation, and discipline.

- Stems the loss of skill and experience from the workforce.
- Allows a company to respond compassionately to the crisis facing many of its employees.

g. Response by the Company

Company Z's response to HIV/AIDS among employees has largely been limited to opportunities provided by the Zambia Export Growers' Association (ZEGA). Activities undertaken include the training of roughly 20 peer educators and occasional on-site voluntary counselling and testing using a mobile facility. The company plans to adopt a workplace HIV/AIDS policy once a standard policy is provided by ZEGA. Three nurses who staff the company's two on-site clinics are able to counsel and assist HIV-positive employees, though they cannot perform HIV tests or treat most opportunistic infections. Instead, employees can take paid sick leave and if necessary receive transport to allow them to seek medical care at the nearby public clinic or a private provider.

Company Z also supports employees who have HIV/AIDS in two ways. First, the company provides nutritional assistance to all employees in the form of twice-daily protein supplement drinks and a monthly allocation of maize meal. Second, recognizing the potential costs of losing critical members of staff, the company pays directly for ART for selected senior managers.

Like many other large employers worldwide,²¹ Company Z also reduces the burden of HIV/AIDS on the firm by relying heavily on non-permanent (seasonal and casual) staff. Non-permanent staff, who make up a large majority of the total workforce, do not have access to the same services and benefits as permanent employees. Casual and seasonal workers, who by definition have no job security, are also likely to lose their jobs when they become ill. The strategy of relying on non-permanent workers was adopted for reasons not related to the AIDS epidemic, as it allows the company to minimize costs when demand for its products falls. Since the loss of a permanent, unskilled employee to AIDS costs the company far more than the loss of a non-permanent worker, however, the reliance on casual labour represents substantial AIDS-related savings for the company.

CHAPTER 3: THE IMPACT OF HIV/AIDS ON SMALL AND MEDIUM SIZED COMMERCIAL AGRICULTURE COMPANIES

Unlike for very large companies, there is little tradition of small and medium-sized companies in Africa providing healthcare or other benefits for employees or implementing an active response to the HIV/AIDS epidemic in other ways.¹³ At the same time, small companies could face higher costs due to AIDS, as they tend to be less resilient to losses of skilled workers and unexpected expenses. In this chapter, we present the results of a survey of smaller companies engaged in the agricultural sector in the same province as the large company analyzed in the previous chapter.

a. Methods

A roster of small and medium-sized companies engaged in the agricultural industry (supplying inputs, processing, production) was obtained from the Zambia National Farmers Union. The roster contained 100 companies in Lusaka District. Companies located more than 45 km from Lusaka were excluded, leaving a sampling frame of 73. We then drew a systematic random sample (every 2nd company from the roster) and repeated the selection process until 37 companies had been selected for the final sample.

An introductory meeting was held with each of the selected companies to explain the project and invite the company to participate in the survey. If the company agreed to participate then an interview was scheduled. Most of the managers chose to fill in the questionnaires themselves, rather than answering an interviewer's questions. The reasons given for this were not having all the information available and confidentiality. If the company declined to participate, then a replacement was selected from the sampling frame using the same selection methodology. Those companies that refused to participate cited confidentiality of company data and/or lack of managerial time as reasons for not participating. In all cases the respondent was a senior employee with a significant role in the running of the company.

The survey instrument was adapted to local conditions from a questionnaire previously used by the CIHD in South Africa. It included sections on company characteristics, workforce characteristics and turnover, employee benefits, and HIV/AIDS issues. Data were collected between October and December 2005.

b. Description of Sample

i. Participation

Although initially 37 companies were sampled, a total of 45 companies were ultimately invited to participate in the study. This was as a result of some refusing to participate (n=9) and others not having completed the questionnaire by the end of the data collection period (n=7). Twenty-nine companies agreed to participate and completed the questionnaire in time to be included in the final sample.

The refusal rate, 36%, is relatively high but still lower than in previous surveys conducted by the authors in South Africa. Companies that declined to participate generally cited

confidentiality of company information or lack of time as reasons for refusing; some initially agreed to participate but did not complete the financial sections also because of confidentiality. The possibility that those that declined to participate were less concerned about or interested in HIV/AIDS than were those that accepted, however, cannot be eliminated.

ii. General characteristics

The general characteristics of the sampled companies are shown in Table 3.1.

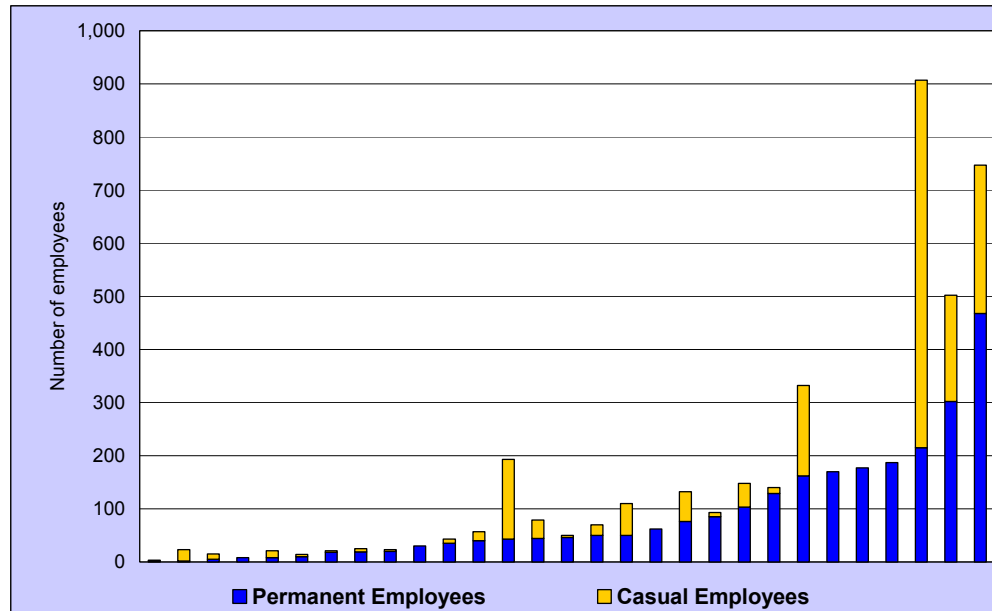
Table 3.1: Characteristics of surveyed companies

Characteristic	No. of companies responding	% of companies responding
Core activity		
Number of companies responding to question	29	100%
Supplying agricultural inputs	11	38%
Commercial farming	8	28%
Processing agricultural outputs	7	24%
Trading in agricultural products	2	7%
Other agricultural activity	1	3%
Size in terms of revenue since 2004		
Number of companies responding to question	24	100%
Stable (no change in revenue)	13	54%
Larger (growth in revenue)	7	29%
Smaller (decline in revenue)	4	17%

The surveyed companies had been in operation for a median of 9 years. Almost three quarters (n=21) of them identified at least one business association to which they belong. These links facilitate sale of their produce. The Zambia National Farmers Union and the Zambia Export Growers Association were the most common affiliations, accounting for almost two thirds (62%) of the companies that belong to any associations.

iii. Labour force

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. Because the distribution of workforce size was skewed, medians are much lower than averages; the median company employed 46 permanent and 13 casual staff. Casual workers averaged roughly 5 months at work per year (145 days). The distribution of workforce size is shown in Figure 3.1.

Figure 3.1: Distribution of workforce size in surveyed companies

The breakdown of permanent employees by job level, age, and sex is shown in Table 3.2. The majority of those employed (63%) were classified by respondents as unskilled or semi-skilled. On average, the surveyed companies employed 11 managers, 24 skilled workers, 60 unskilled workers, and 73 casuals. The total number of permanent employees in the sampled companies was 5% higher than in the previous year, suggesting little overall growth in employment by sector.

Table 3.2: Profile of the permanent workforces of surveyed companies

Category	No. of companies responding	Average		Median no. per company
		No. per company	% of total	
All permanent employees (total=2,566)	29	89	100%	46
<i>Job level</i>				
Managers	29	11	12%	6
Skilled workers	27	24	25%	21
Unskilled/unskilled workers	26	60	63%	20
<i>Sex</i>				
Male	29	61	77%	32
Female	29	18	23%	7
<i>Age</i>				
Under age 35	25	46	63%	12
Over age 35	25	27	37%	9

Fewer than 10% of those employed were classified as migrant workers, whose main homes were elsewhere in Zambia. Eight of the companies (28%) had employees who were members of a trade union. Just over a third (36%) of all permanent staff had no education or some primary school; almost half (48%) had attended or completed secondary school. Only 11% had a university education, while 6% had specialised training for the agriculture industry.

iv. Salaries and benefits for permanent employees

The surveyed companies reported that an average of 28% of annual operating costs were associated with labour, including salaries and wages and benefits and allowances. Average annual base salaries were ZMK 3,531,000 (\$778), ZMK 1,495,000 (\$329), and ZMK 464,016 (\$102) for managers, skilled workers, and unskilled workers, respectively. The cost to the companies of employee benefits ranged from approximately 18% to 28% of base salaries. In most cases these benefits were limited to permanent employees.

Medical benefits provided by the surveyed companies are shown in Table 3.3.

Table 3.3: Medical benefits provided by surveyed companies

Type of benefit	No. of companies responding	No. (%) of responding companies that provide this benefit
Any company-sponsored medical benefit of any kind	25	15 (60%)
Health insurance or medical aid	21	10 (48%)*
Contract with private provider	13	8 (62%)
Reimbursement for medical expenses	12	6 (50%)
On-site clinic	14	4 (29%)
Other medical benefit (unspecified)	12	2 (17%)

*About half the companies exclude unskilled workers from this benefit.

For each type of medical benefit listed in Table 3.3, at most only one company reported offering treatment for HIV/AIDS as part of the benefit. Generally it was either excluded or the respondent was not sure whether it was included. Those companies that did not offer any medical benefits to unskilled employees cited high costs as the main reason for this policy.

Most companies surveyed also provide funeral and death benefits to the beneficiaries of permanent workers who die in service. These benefits are described in Table 3.4.

Table 3.4: Funeral, death, and disability benefits provided by the surveyed companies

Type of benefit	No. of companies responding	% of responding companies that provide benefit	Average cost to company per claim	
			ZMK	USD
Funeral benefit	28	89%*	1,492,173	329
Death benefit	28	82%†	2,626,157	578
Disability benefit	26	42%	1,530,333	337

*5 companies provide funeral benefits only to managers and skilled employees

†7 companies provide death benefits only to managers and skilled employees

Finally, leave allowances per year at the surveyed companies are shown in Table 3.5.

Table 3.5: Leave allowed by surveyed companies

Type of leave	No. of companies responding	No. (%) of responding companies that provide this leave	Median no. of days allowed/year by companies providing this type of leave	
			Managers and skilled workers	Unskilled workers
Sick leave (paid)	27	25 (93%)	90	30
Funeral leave (paid)	25	22 (88%)	7	3.5
Annual leave (paid)	27	27 (100%)	24-27	24
Other leave (paid)	27	14 (52%)	90	10
Unpaid leave	25	12 (50%)	14	10

c. Loss of Employees to HIV/AIDS

Overall annual attrition of permanent employees in the surveyed companies averaged 14% in the year preceding the survey, a rate consistent with findings among SMEs in South Africa¹³ and in the tourism sector in Zambia.²²

Table 3.6: Attrition and hiring at the surveyed companies in the 12 months preceding the survey

Job level	No. terminating service (any cause)	% terminating service	No. hired	% hired	Net change
Unskilled	225	9%	512	20%	+287
Skilled	107	4%	59	2%	-48
Managers	21	1%	24	1%	+3
Total	353	14%	595	23%	+242

Of the employees who terminated service during the year, 64% were unskilled workers, 30% were skilled workers, and 6% were managers. The distribution of hiring across the job bands in Table 3.6, however, suggests that the structure of the workforce is changing. All managers who left were replaced, but there was a large shortfall of skilled employees who were not replaced. More than twice as many unskilled employees were hired than terminated, leading to overall workforce growth despite the loss of skilled workers.

Among the total of 353 employees who terminated service in the year preceding the survey, 29 (8.2%) did so due to ill health or death, as shown in Table 3.7.

Table 3.7: Terminations due to health in the surveyed companies

Reason for termination	Previous 0-12 months		Previous 13-24 months	
	Total for sample	Average/company	Total for sample	Average/company
Ill health	9	0.3	6	0.2
Death—natural causes (illness)	20	0.7	13	0.4
Death—unnatural causes (accidents, violence, etc.)	1	0.0	1	0.0
Total	30	1.0	20	0.7

In the past two years there were only two health-related terminations due to unnatural causes (accidents, violence). In the year preceding the survey, each company in the sample lost an

average of one permanent employee, or 1% of the workforce, as a result of illness or death. Cause of death was reported for 19 of the 20 illness-related deaths in the 12 months preceding the survey, as shown in Table 3.8.

Table 3.8: Reported causes of death in 12 months preceding survey

Cause	Deaths reported		Likely to have been HIV/AIDS-related?
	Number	%	
HIV/AIDS	5	26%	YES
Pneumonia/respiratory illness	4	21%	YES
Tuberculosis	3	16%	YES
Malaria	2	11%	NO
Cancer	1	5%	NO
Unspecified illness	4	21%	MOST
Total	19	100%	79%

In total, we estimate that roughly 15 of the 19 illness-related deaths with cause reported were due to AIDS. It is likely that at least half of the ill-health terminations were also AIDS-related, giving the sampled companies a total of approximately 20 terminations due to AIDS over the course of the year.

While the sample size and number of deaths and ill-health terminations is too small to draw definite conclusions, health-related losses within these companies' workforces appear to be rather low. Applying the results of the 2001-2002 Zambia DHS to the combined employee population of these companies, with adjustment for age and sex, yields an average HIV prevalence estimate of 26.4%, or 676 HIV-positive individuals. We would then expect AIDS-related mortality to average approximately 2.6% per year, or a total of 67 AIDS-related terminations per year. This is more than twice the number of terminations due to ill health and death, and more than three times the number we estimated as resulting from AIDS.

There are several possible reasons for this discrepancy between estimated and observed mortality. These include 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. Another possible explanation is that almost two thirds of the combined workforce is comprised of men under the age of 35. Since HIV prevalence among males only starts climbing after age 25 and does not peak until the 30s, it may be that most HIV-positive employees of these companies were recently infected and are not yet in the symptomatic stages of disease.

Only one third of respondents believed that their companies currently have employees who are chronically ill. Reported causes of chronic illness are shown in Table 3.9.

Table 3.9: Reported causes of illness among chronically ill employees

Cause	Ill employees reported		Likely to be HIV/AIDS-related?
	Number	%	
HIV/AIDS	7	35%	YES
Pneumonia/respiratory illness	4	20%	YES
Tuberculosis	5	25%	YES
Malaria	1	5%	NO
Alcohol or drug abuse	1	5%	NO
Unspecified illness	2	10%	MOST
Total		100%	85%

As Table 3.9 indicates, approximately 17 of 20 chronically ill employees are likely to have HIV/AIDS-related illnesses. Given the relatively high prevalence of HIV in the Lusaka area, it is unlikely that the 17 companies that reported no chronically ill workers are truly free of this burden, unless those who become ill are discharged from employment. More likely explanations are that the employees successfully hide their illness from their managers and/or that many HIV-positive workers are still quite young and have not yet become symptomatic.

d. Cost of HIV/AIDS to the Companies

In attempting to gauge the impact of HIV/AIDS on the small companies we surveyed, we utilize the same conceptual framework as for the large company analysis. For the small companies, however, the data are more fragmented, and we must rely on both quantitative estimates and managers' perceptions of impact. In this section we review quantitative data; the next section focuses on managers' perceptions.

i. Illness-related costs

Most companies (77%) reported that the amount of sick leave taken had not changed over the two years preceding the survey. Two companies indicated that sick leave had increased among unskilled staff, while 5 said that it had fallen. Nearly 80% of the companies said that they do *not* replace their skilled or unskilled staff with overtime or casual workers when they are ill.

For the 20 employees reported to have died of natural causes, illness preceding death was in many cases protracted. Twelve of the deceased (60%) were sick for 3-6 months, 1 for 1-3 months, 3 for less than a month, and 4 for less than a week. The 20 employees who were chronically ill at the time of the survey were reported to have missed an average of 40 days of work each as a result of illness. Companies reported having hired replacement labour to compensate for the sick workers in fewer than half of these cases.

Many companies in the sample pay for medical care when employees are sick, as shown in Table 3.3. While it is safe to assume that employees with HIV/AIDS do utilize more medical care than average and that their employers incur potentially large costs as a result, we were not able to obtain a quantitative estimate of the amounts involved.

ii. Termination-related costs

Among the 25 companies that provide funeral assistance to the beneficiaries of employees who die in service, the average cost to the company per funeral is ZMK 1,492,173, or about \$329. The 23 companies that indicated that they also provide a death benefit incur an

average cost per death of ZMK 2,626,157 (\$578). For the specific employees who died in service during the year preceding the survey, companies reported actually spending an average of ZMK 7,844,571 (\$1,728) in total per death.

iii. Replacement-related costs

Companies spend relatively little to replace employees who leave the workforce. Average vacancies are short, ranging from an average of 1 week for unskilled staff to approximately 2 months for managers. Of the employees who died of natural causes in the previous year, 90% were replaced; 80% of the replacements were found in less than a month.

Managers reported spending a median of 2-12 hours of their own time to hire a new employee. The average cost of recruitment ranged from ZMK 687,500 to ZMK 2,314,954 (\$150-510) depending on job band. Most companies (over 60%) did not require a medical exam prior to appointment; for those that did, medical exams ranged in cost from ZMK 75,000 to ZMK 128,333 (\$17-28).

Only a few companies reported the amounts they spend on training. The median costs reported by those providing this information were ZMK 1.95 million (\$430) to train a manager, ZMK 2.1 million (\$463) to train a skilled worker, and ZMK 760,000 (\$167) to train an unskilled worker. Training of a new manager also took a median of three weeks of a supervisor's time, while training a new skilled or unskilled worker took one week of a supervisor's time. New unskilled workers were regarded as fully productive after two weeks on the job, while new skilled workers and managers required a month on the job to reach full productivity.

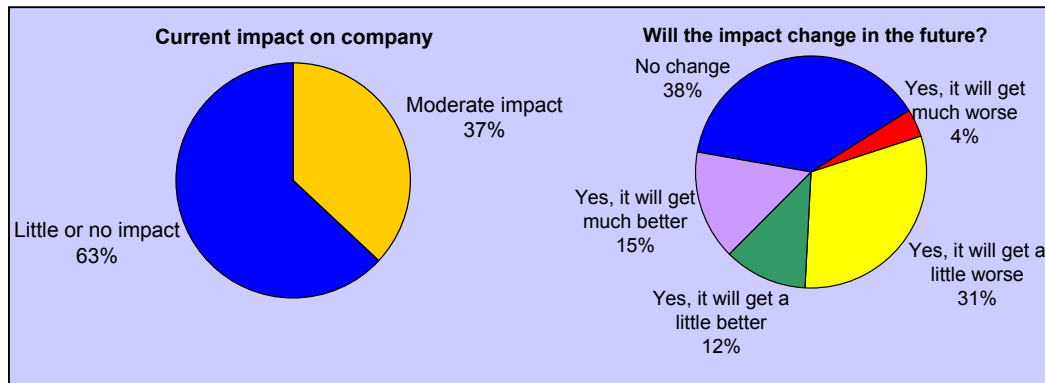
One third of the companies reported difficulty in finding the skills needed for their businesses. Most of these were looking for technical personnel.

e. Managers' Perceptions of Impacts

In addition to requesting information about the actual costs incurred by the surveyed companies as a result of HIV/AIDS, we also asked respondents—typically the human resources manager or another senior manager of the company—about their perceptions of the impacts of the disease. 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 (n=27).

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 3.2.

Figure 3.2: Managers' views of the current and future impact of HIV/AIDS on their companies



Those who expected the impact to lessen in the future gave as reasons the low level of promiscuity among workers, the current program on peer education, and the medical support offered to staff. Those who expected a more severe impact said that there is a lack of awareness of HIV/AIDS and that the company already has a number of widow-headed households.

We also asked respondents to rank HIV/AIDS as a concern for their own companies and as challenge to the growth of Zambia's agricultural sector. Respondents were given a list of common problems facing small businesses in their sector, as well as space to add their own concerns. They were then asked to rank each problem, first in terms of its importance to their own company and then in terms of its importance to the Zambian agricultural sector as a whole. Results of this ranking exercise are shown in Table 3.10.

Table 3.10: Ranking of company problems and industry challenges

a. Problems faced by respondent's own company	Rank
Cost or availability of inputs or materials for production (including transport)	1
Taxes	2
Cost of labour	3
Prices you receive for your product	4
Market size/demand for your product/number of clients	5
Availability of skilled labour	6
HIV/AIDS	7
Environmental or climate conditions	8
Productivity of employees	9
Government regulations	10
Crime	11
Infrastructure	12
Availability of capital, credit, loans or financing	13
Other health problems	14
Political or economic instability	15
b. Challenges faced by agricultural sector	Rank
Economic conditions in Zambia	1
Lack of, or high cost of, investment capital or credit	2
Government policies related to farming	3
Changes in environmental conditions related to farming	4
Maintenance of infrastructure and public services	5
Cost or productivity of labour	6
HIV/AIDS	7
Crime	8
Scarcity of skilled or trained workers	9
Political conditions in Zambia	10
Other health issues (not HIV/AIDS)	11
Instability in neighbouring countries	12

In both exercises, HIV/AIDS ranked seventh in importance among respondents' concerns. While this is slightly higher than we found in previous research in South Africa and Zambia, it is still behind the core economic issues facing small businesses: costs, prices, taxes, access to credit, etc. The importance that respondents assign to HIV/AIDS, both as a concern for their own companies and for their sector as a whole, is consistent with managers' perceptions of little or no impact from the epidemic and with the actual costs they reported incurring.

f. Company Responses

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. Among those who had, the concerns discussed included reduced labour productivity due to HIV/AIDS, low levels of HIV/AIDS awareness, and skills development. On the other hand, most companies (72%) reported having undertaken some HIV/AIDS-related activity, and frequently more than one. The activities undertaken are shown in Table 3.11.

Table 3.11: HIV/AIDS activities undertaken by surveyed companies (n=29)

Activity	Number of companies undertaking this activity	% of companies undertaking this activity	Number of companies reporting cost of activity	Reported average cost of activity to company	
				ZMK	USD
Arranging educational sessions for employees	15	52%	11	3,787,818	834
Providing educational materials to employees	11	38%	8	635,012	140
Promoting or facilitating access to condoms	11	38%	10	0	0
Promoting or facilitating access to VCT	10	35%	6	83,333	18
Supporting HIV/AIDS activities in the community	10	35%	6	626,666	138
Facilitating or paying for treatment of HIV-related illnesses	6	21%	6	833,333	184
Facilitating or paying for ART	8	28%	5	5,000,000	1,101
Providing services or support to families of HIV positive employees	1	3%	0		

The activities that are 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. A number of respondents said that their company had considered an activity but decided against it. While a number of reasons for this decision were cited, “No one ever asked for the service” was consistently the main explanation.

Finally, we asked respondents what factors might motivate them to provide greater HIV/AIDS-related services to employees. Over a quarter of the respondents felt that if they could partner with a HIV/AIDS service provider then they would be able to do more. One fifth felt that they needed a clear HIV/AIDS workplace policy before they could think about offering services.

CHAPTER 4: DISCUSSION AND CONCLUSIONS

a. Summary of Key Findings

For the commercial agriculture sector in Central Province, we found the following:

- The financial costs of HIV/AIDS to commercial agriculture companies appears to be low. Even for a large company, which should incur higher costs than do small companies, AIDS is estimated to increase labour costs by less than 2%. These results are consistent with findings from other low-cost companies in other sectors and in other countries in sub-Saharan Africa, as shown in Table 4 below. (Note that the estimates in Table 4 are not strictly comparable, as a slightly different set of cost was included for each company, as relevant, and costing methods varied depending on data availability.)

Table 4.1: Comparison of Company Z to selected companies in other African countries

Base year of study	Company	Location	Sector	Approx. workforce size	Estimated HIV prevalence in base year	Average cost per AIDS-related termination (multiple of average salary)	Estimated aggregate costs in base year [†] (% of total salaries)
1999	SA-B ⁶	So. Afr.	Agribusiness	7,500	23.7%	1.3	2.7%
2001	SA-D ⁶	So. Afr.	Mining	700	23.6%	0.8	1.9%
2001	SA-E ⁶	So. Afr.	Retail	500	10.5%	0.8	0.8%
2001	SA-F ⁶	So. Afr.	Media	3,500	10.2%	6.6	4.2%
2002	SA-H*	So. Afr.	Manufacturing	1,500	14.0%	2.0	2.0%
2003	SA-A*	So. Afr.	Parastatal	>25,000	10.8%	2.2	1.2%
2003	UG-A ⁷	Uganda	Manufacturing	300	14.4%	1.2	1.9%
2003	UG-B ⁷	Uganda	Agribusiness	500	5.6%	1.9	1.2%
2004	Co 1	Kenya [‡]	Agribusiness	22,000	10.0%	1.5	1.5%
2005	ZM-1	Zambia [‡]	Tourism	350	36.8%	3.5	10.8% [§]
2005	Co Z	Zambia	Agribusiness	1245	28.5%	2.5	1.7%

[†]In the absence of effective treatment with antiretroviral therapy.

*Unpublished report.

[‡]Results available in other CHGA country reports.

[§]Actual cost is substantially lower, due in part to access to treatment.

Company Z falls generally within the lower range of costs estimated for private sector firms so far. This would be expected for a company that relies heavily on unskilled labour and, in particular, on non-permanent workers. For casual and seasonal workers, and even unskilled permanent employees, AIDS tends to impose few costs on the company as a whole. This is likely to apply to companies of all sizes.

- 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.

- The large company we studied has taken some steps to address HIV/AIDS among employees, but its program is relatively modest. Treatment for AIDS has recently become available at public sector clinics, however, taking some pressure off the company. The analysis of the returns to investment in treatment suggests that Company Z can afford to invest some money in obtaining treatment for its permanent staff but is unlikely to be willing to bear the entire cost.
- Small companies have also 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.

b. Issues, Opportunities, and Recommendations

The results presented in this report raise a number of important issues and questions about HIV/AIDS and commercial agriculture in Zambia. They also point to a few opportunities for improvement.

- For the large company we studied, 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, such as on-site HIV testing, transport to the clinic, a guarantee of confidentiality, and a commitment to retain HIV-positive employees in the workforce provided that they adhere to the therapy and perform adequately. A nongovernmental organization with donor support could be helpful in providing services and/or brokering a public-private partnership.
- The trend toward reliance on non-permanent workers that we noted for Company Z is gaining speed throughout the world and is by no means limited to commercial agriculture, to multinationals, or even to Africa. In most cases, it is also not a direct response to HIV/AIDS, but rather to the competitive pressures of the global marketplace.²¹ For commercial farms, which are labour intensive and often have small profit margins, maintaining a flexible and low-cost labour supply that can be adjusted for the vagaries of weather, crop yields, and market demand is especially important. As a result, it is unlikely that casual and seasonal workers will be made permanent or offered benefits equivalent to those of permanent staff. In projecting the demand for public sector prevention and treatment services, governments and donor agencies should bear in mind that non-permanent workers are almost certain to utilize public facilities.
- The lack of interest in HIV/AIDS shown by small company managers is consistent with findings of earlier surveys in South Africa, Kenya, and Zambia. Because small companies invest little in recruiting and training workers and offer few employee benefits, they generally incur relatively low costs as a result of HIV/AIDS. Small commercial agriculture companies are also 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.
- The data collected in Central Province 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 Central Province.

c. Limitations of the Study

There are two main limitations to this study that should be borne in mind when interpreting the results.

i. *Generalizability*

The most important limitation of the research presented in this report is its generalizability to settings outside Central Province. The study aimed to assess the impact of HIV/AIDS on commercial agriculture in Zambia. Small company data were drawn, however, from a relatively small number of companies located near the country's capital. While the findings are likely to be valid for many other companies, it is not clear how widely generalizable they are. In particular, to represent the workforces of companies located near Lusaka, we used urban rates of HIV infection drawn from a survey conducted in 2001. Companies located in more rural areas likely face lower HIV prevalence. There may also have been changes in HIV prevalence in the five years since the DHS survey, though the magnitude of such changes is not known.

ii. Unmeasured impacts

Figure 1 in the first chapter of this report illustrates the wide range of potential costs of HIV/AIDS to employers. In both our large and small company analyses, we were able to assess only some of these costs, primarily those associated with the loss of an individual employee to the disease. We did not include the time managers must spend coping with the impacts of the epidemic, the disruption it causes to established working units and processes, the effect it has on the morale and motivation of both healthy and sick employees, and the overall loss of workforce experience and skill. Because their supply of labour is flexible, compensation is productivity-based, most workers are unskilled or unskilled, and many tasks are performed by individuals, rather than by teams, we speculate that commercial agriculture companies are more resilient to the organizational impacts of HIV/AIDS than are firms in other sectors. Some of the unmeasured impacts, such as the drain on managers' time, are still likely to be important, however. The results presented here should therefore be regarded as very conservative estimates of the true costs of AIDS.

References

1. AIDSCAP Project. African Workplace Profiles. Washington, DC: Family Health International, 1995.
2. Smith J and Whiteside, A. The socioeconomic impact of HIV/AIDS on Zambian Businesses. London: BEAD Group and Commonwealth Development Corporation, 1995.
3. Jones C. The microeconomic implications of HIV/AIDS [dissertation]. School of Development Studies, University of East Anglia, 1996.
4. Greener, R. Impact of HIV/AIDS and options for intervention: results of a five company pilot study. Gaborone: Botswana Institute of Development Policy Analysis, Working Paper No. 10, August 1997.
5. Morris CN, Burdge DR, Cheevers EJ. Economic impact of HIV infection in a cohort of male sugar mill workers in South Africa from the perspective of industry. Durban, South Africa: International AIDS Economics Network Symposium, July 2000.
6. Rosen S, Vincent JR, MacLeod W, Fox M, Thea DM, Simon JL. The cost of HIV/AIDS to businesses in southern Africa. *AIDS* 2004;18(2):317-24.
7. Feeley R, Bukuluki P, Collier A, and Fox MP. The impact of HIV/AIDS on productivity and labour costs in two Ugandan corporations. Boston: Center for International Health and Development, Boston University, 2004.
8. Koopman C, Pelletier KR, Murray JF, Sharda CE, Berger ML, Turpin RS et al. Stanford presenteeism scale: health status and employee productivity. *Journal of Occupational and Environmental Medicine* 2002;44:14-20.
9. Kessler RC, Barber C, Beck A, Berglund P, Cleary PD, McKenas D et al. The World Health Organization Health and Work Performance Questionnaire (HPQ). *Journal of Occupational and Environmental Medicine* 2003;45:156-74.
10. Rugalema G. HIV/AIDS and the commercial agricultural sector of Kenya. Rome: Food and Agriculture Organization, 1999.
11. Feeley R, Bukuluki P, and Cowley P. The role of the private sector in preventing and treating HIV/AIDS in Uganda: an assessment of current activities and the outlook for future action. Boston: Center for International Health and Development, Boston University, 2004.
12. Bureau for Economic Research. The impact of HIV/AIDS on selected business sectors in South Africa. Johannesburg, South Africa, South African Business Coalition Against HIV/AIDS, 2004.
13. Connelly P, Rosen S. Will small and medium enterprises provide HIV/AIDS services to employees? An analysis of market demand. *South African Journal of Economics* 2005; 73: 613-26.
14. Rosen S, Vincent JR, MacLeod W, Fox MP, Thea DM, Simon JL. The cost of HIV/AIDS to businesses in southern Africa. *AIDS* 2004;18(2):317-24.
15. Evian C, Fox MP, MacLeod W, Sotow SJ, Rosen S. The prevalence of HIV in workforces in southern Africa, 2000-2001. *South African Medical Journal* 2004;2004(February).
16. Jones C. What HIV cost a tea estate in Malawi. *AIDS Analysis Africa* 1998;8(4 (Dec 97/Jan 98)):7-9.
17. Coutinho A. An assessment of the economic impact of HIV/AIDS on the Royal Swaziland Sugar Corporation [dissertation]. Johannesburg, South Africa: Department of Community Health, University of the Witwatersrand, 2000.
18. Fox MP, Rosen S, MacLeod WB, Wasunna M, Bii M, Foglia G et al. The impact of HIV/AIDS on labour productivity in Kenya. *Trop.Med.Int.Health* 2004;9(3):318-24.
19. FAO. Exports: commodities by country. Rome: Economic and Social Department, Statistics Division, United Nations Food and Agriculture Organization, 2004. Available

from <http://www.fao.org/es/ess/toptrade/trade.asp?lang=EN&dir=exp&country=251>.
Accessed 11 February 2006.

20. Central Statistical Office/Central Board of Health/ORC Macro. *Zambia Demographic and Health Survey 2001-2002*. Lusaka, Zambia: Zambia Central Statistical Office, 2003.
21. Rosen S, Simon JL. Shifting the burden: the private sector's response to the AIDS epidemic in Africa. *Bull. World Health Organ* 2003;81(2):131-7.
22. Rosen S, Hamazakaza P, and Long L. *The impact of HIV/AIDS on the tourism sector in Zambia*. Boston: Center for International Health and Development, Boston University, 2006.