The Impact of HIV/AIDS on Productivity and Labor Costs in Two Ugandan Corporations

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The opinions expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Agency for International Development.
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<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AIDS</td>
<td>Acquired Immune-deficiency Syndrome</td>
</tr>
<tr>
<td>ARCH</td>
<td>Applied Research in Child Health</td>
</tr>
<tr>
<td>ARV</td>
<td>Antiretroviral</td>
</tr>
<tr>
<td>CPI</td>
<td>Consumer Price Index</td>
</tr>
<tr>
<td>HAART</td>
<td>Highly active antiretroviral therapy</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>ILO</td>
<td>International Labor Organization</td>
</tr>
<tr>
<td>NA</td>
<td>Not available</td>
</tr>
<tr>
<td>TPA</td>
<td>Third Party Administrator</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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1. Executive Summary

The public health and social burden of the HIV/AIDS epidemic in Africa is evidenced in rising death rates, falling life expectancies and increasing numbers of orphans. The loss of educated workers due to HIV/AIDS is likely to retard economic development, and employers should have an interest in safeguarding the health of their workers. As the cost of antiretroviral drugs and therefore highly active antiretroviral therapy (HAART) falls, it becomes particularly important to quantify the costs that the employer is incurring due to AIDS infections in the work force. These costs, which could be delayed or averted by effective treatment, can then be reasonably compared with the costs of such treatment.

A pioneering study by Rosen et al quantified the economic burden to employers resulting from HIV/AIDS in Southern Africa. Depending on the structure of the labor force, HIV seroprevalence and employee benefits, measured costs linked to HIV/AIDS varied from 0.4% to 5.9% of total labor costs at the companies studied. This methodology has yet to be applied elsewhere in Africa. Here, we apply a version of that methodology to two employers in Uganda: a country where the AIDS epidemic is more mature but the economy less developed than in South Africa.

Both companies studied were local subsidiaries of multi-national manufacturing corporations. Total employment in the Ugandan operations of the two companies in 2003 was just under 1,000. Looking back over five years at Company A and three years at Company B, we identified 35 workers who died or took medical retirement due to a chronic illness that was probably AIDS. The annual rate of such deaths and retirements in the Ugandan workforces averaged 1.6% for Company A and 0.6% for Company B of total employment in 2003.

At each company, a case-comparison methodology was used to estimate the difference between absenteeism and medical care costs for cases (those who died or retired due to chronic AIDS-like illness) and comparisons (employees of similar age, sex and job grade who remained in the work force). To these costs we added various benefits (funeral benefit, gratuity, family relocation) paid at the time of the worker’s death or retirement. These termination costs were net of any payouts from contributory retirement plans funded by previous worker and employer contributions.

To these individual worker related costs, we added several categories of costs incurred by the employer. The corporate Human Resource (HR) departments estimated costs of recruiting and retraining a replacement worker. Supervisors were interviewed to estimate the percentage of normal productivity lost when an AIDS-sick worker was present at work. Supervisors also estimated the percent of their time spent handling the problems created by the worker’s illness and the resulting vacancy and transition to a replacement worker. The costs measured, on a per worker basis, are summarized in the table below.
Table 1: The costs associated with the death or retirement of an HIV/AIDS sick worker

<table>
<thead>
<tr>
<th></th>
<th>Company A</th>
<th>US $*</th>
<th>Company B</th>
<th>US $</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shillings (000)</td>
<td></td>
<td>Shillings (000)</td>
<td></td>
</tr>
<tr>
<td>Incremental absenteeism</td>
<td>2,118</td>
<td>1,086</td>
<td>522</td>
<td>268</td>
</tr>
<tr>
<td>Additional medical care</td>
<td>241</td>
<td>124</td>
<td>745</td>
<td>382</td>
</tr>
<tr>
<td>Gratuity, funeral and related</td>
<td>452</td>
<td>232</td>
<td>1,706</td>
<td>875</td>
</tr>
<tr>
<td>death/retirement benefits</td>
<td>2,601</td>
<td>1,334</td>
<td>21,664</td>
<td>11,110</td>
</tr>
<tr>
<td>Recruitment/training of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>replacement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervisor time</td>
<td>2,445</td>
<td>1,256</td>
<td>2,001</td>
<td>1,026</td>
</tr>
<tr>
<td>Lost Productivity while</td>
<td>9,306</td>
<td>4,772</td>
<td>14,159</td>
<td>7,261</td>
</tr>
<tr>
<td>present but sick</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total cost per worker lost</strong></td>
<td><strong>17,167</strong></td>
<td><strong>8,804</strong></td>
<td><strong>40,796</strong></td>
<td><strong>20,921</strong></td>
</tr>
<tr>
<td>% of annual pay/benefits to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>an average worker</td>
<td><strong>120%</strong></td>
<td></td>
<td><strong>185%</strong></td>
<td></td>
</tr>
</tbody>
</table>

The annual total for these costs of worker attrition was 1.9% of the 2003 wage and salary bill at Company A and 1.2% of the 2003 wage and salary bill at Company B.

It is worthwhile to compare these costs to the costs of HIV/AIDS treatment. The Joint Center for Clinical Research in Kampala recently announced that the price of standard first-line triple therapy has now fallen to 29,000 shillings (US$17.50) per month. Data collected by the authors in 2003 showed that HAART was available at a cost of $30 to $100 per month in private sector clinics in Kampala. It should now be possible for Ugandan employers to contract for HAART treatment of a worker for around 825,000 shillings per year. This is only 4.8% of the cost per worker lost at Company A and 2% of the cost per worker lost at Company B.

* The conversion rate used throughout this paper is that of US $ 1: 1,950 shillings, as recorded on December 1, 2003.
2. Background

As the epidemic of HIV/AIDS has unfolded in Africa, increasing attention has been placed on its economic and social, as well as public health, implications. With dramatically declining life expectancy driven by AIDS, the loss of educated citizens in prime working years clearly retards the development of low-income African nations. However, the dynamic effects on firms and labor markets are less clear. A better understanding of the costs of HIV/AIDS to employers may support increased investments in HIV prevention and treatment. With the burden of disease raised by HIV prevalence rates, investment in interventions against HIV/AIDS may reduce the costs of chronic illness in the labor force to such an extent that the firm actually sees savings. An understanding of the costs imposed on African employers by HIV/AIDS is particularly important as reduced costs for antiretroviral drugs increase pressure for employers to provide antiretroviral therapy (HAART) for workers and their dependents.

In a recently published article, Rosen et al described research undertaken with six major employers in the Republic of South Africa and Botswana. They developed a typology of HIV related costs incurred by employers as follows:

Figure 1: The costs of AIDS to business

Rosen et al empirically measured items shown as direct costs in their South African studies. With the exception of insurance premiums, this study measured the same effects.
Neither company studied buys health insurance for employees; but they provide some medical care at on-site clinics and purchase (directly or through a third party administrator) medical care for employees. Slightly different methodologies are used for some items because of the differences in corporate record keeping. Death and retirement benefits are funded through accrued payroll related contributions, or by direct employer payment at the time of the event. Insurance markets for such benefits are not well developed, as they are in South Africa.

Rosen et al found that the measured costs associated with worker illness, death and retirement due to HIV/AIDS ranged from 0.4% to 5.9% of labor and salary costs in the six companies studied in Southern Africa. In this study, we use a methodology derived from the work by Rosen et al to measure the impact of HIV/AIDS on labor costs in two large Ugandan employers. The methodology has not previously been applied in Uganda. Few estimates of any kind have been made of the impact of HIV/AIDS on private sector labor costs in countries like Uganda. Compared to South Africa, Uganda has a more developed HIV epidemic and a less developed economy. An ILO study in 1997 reported that AIDS deaths in the period 1989-1993 ranged from 0.4% to 3.5% of the peak workforce in the five Uganda employers studied. Successive antenatal surveillance studies in Uganda have documented a decline in HIV seroprevalence to a nationwide level of 6.2% (7.9% major urban areas, 5.1% elsewhere) in 2002. Last year, an estimated 75,000 Ugandans died of AIDS. With the declining prevalence rate, a disproportionate number of HIV positive cases should be in the later stages of infection, developing AIDS.

Recent work by the researchers has shown that Ugandan industries do not fully understand the costs they are incurring due to the HIV/AIDS epidemic. In a USAID sponsored survey of 37 Uganda employers carried out in late 2003, over half said that HIV/AIDS is not a management issue for the company, and only 11% of the sample placed HIV/AIDS in the top five management issues. While seroprevalence surveys have become commonplace at large South African employers, no Ugandan company had undertaken an anonymous test of its workers. As such, Ugandan firms tend to base their estimated HIV prevalence on reported national levels or the amount of recently observed mortality and morbidity in the workforce.

Although they do not have data on the total labor costs imposed by HIV infection, some employers are responding to the epidemic. The fall 2003 employer survey showed that 43% of respondents had regular HIV prevention education programs for their workers; 27% explicitly offered Voluntary Counseling and Testing (VCT) to their workers; and additional companies provided VCT indirectly through medical insurance plans. Only 32% of the sample offered HAART to their workers, despite drug and physician costs that had fallen to $30-$100 per month in private clinics in Kampala.

In this study, we seek to quantify the costs that Ugandan employers are incurring due to HIV/AIDS. The two participating companies are relatively sophisticated local subsidiaries of multinational corporations with modern HR departments that agreed to share personnel data with the study team. Both companies have recently taken the
decision to offer HAART to employees. However, data was collected for a period prior to corporate sponsorship for HAART.

This study provides the opportunity to test the South African methodology in a country at a different stage of the epidemic and at a different level of economic development. The recent employer survey showed that data on the cost impact of HIV (as well as the actual cost of treatment) might influence company decisions on HIV policy. Comparing the estimated HIV-related increase in labor costs to the newly decreased cost of HAART may encourage other companies to offer HAART as a corporate benefit, thus prolonging the working lives of employees and decreasing the burden on expanding public sector HAART treatment programs.

3. Objectives of the study

The objective of this study is to assess the impact of HIV/AIDS on two Ugandan Corporations. In order to obtain this objective, the study addressed the following questions:

1. What is the impact of HIV/AIDS on individual labor productivity in the absence of treatment?

2. What is the impact of HIV/AIDS on benefit, absenteeism and medical costs in the labor force?

4. Methodology

The study was conducted at the major employment sites of two large corporations in Uganda. For the sake of confidentiality of the organizations involved, the companies were given the titles of Company A and B.

Company A is a large manufacturing business, with a head office in Kampala, a plant in a more remote area and two distribution depots. The plant is located in an area where reported HIV infection rates are higher than the national average infection rate. The firm currently employs about 300 people; approximately 10% are female. The company has been downsizing employment, with the directly employed workforce cut approximately in half over the last decade. The reduction in the number of workers present at company sites has been less, since several functions have been outsourced.

Changes in the size and structure of the work force at Company A may influence the costs we measured. First, to the extent the Company was overstaffed, production may not have been reduced by absenteeism or the reduced productivity of infected workers. We show “lost” wages associated with absenteeism or reduced productivity as if the work unit were capable of full and efficient production only if all scheduled workers were present and healthy. Second, the South African studies showed that there is often a high
prevalence of HIV in the less skilled job bands, for example security or cleaning services. Company A’s policy of downsizing and outsourcing may have shifted some of the burden of the disease away from their production costs.

Company B is spread over 10 different locations, including two large factories. It currently employs over 500 people in a highly unionized workforce. Company B has not retrenched employment to the extent of Company A, but in the last five years it has outsourced some of the lowest paid job categories.

Both firms are units of multinational corporations. They were identified as feasible for a study of this design because they have fully operational HR departments and good records of employee data. The study population was the entire workforce of both organizations, slightly less than 1,000 employees in total. During the period for which data was collected, the companies did not provide HAART for the workforce. Both companies have since implemented HAART programs.

The intention of the methodology was to identify all the costs associated with chronic illness and death in the workforce, use this to form a mean AIDS cost per sick employee, then aggregate these costs and compare to the total wage bill. The incremental costs are presented in three ways:

- the average cost for a worker lost to AIDS in each company’s workforce
- the cost as a multiple of the average annual labor cost for a worker in each company’s workforce
- the total annual cost of HIV/AIDS among employees as a percentage of the total annual wage and salary costs expended by each company.

To estimate the total annual cost, we multiplied the cost per HIV/AIDS-related termination (at current wages) by the average annual number of deaths and ill-health retirements observed over the study period.

As a starting point, the study team identified every employee that has left the workforce due to HIV/AIDS. Cases were identified going back five years from September 2003 for Company A and three years for Company B, using the HR files that are maintained by each company. The stigma associated with AIDS in Uganda means that few records show direct evidence of the AIDS status of the employee. We therefore made the assumption that workers with a gradually worsening chronic illness were living with HIV/AIDS. Workers who died or retired due to occupational or other accidents, violence, or diseases of sudden onset (like myocardial infarction) were excluded as cases.

The HR departments assisted us in matching each case with three comparisons of the same sex, similar job assignment and age (within five years of the age of the case). The total number of cases over the study period was then divided by the number of years.

\[ \text{\textsuperscript{\textregistered}} \text{The variation in review period is a function of corporate record keeping at the two companies.} \]
studied (five years at company A, three at company B) to obtain the average annual number of workers lost to apparent HIV/AIDS each year. Finally, the average annual number of workers lost has been multiplied by the incremental costs per “lost” worker.

Data was also collected on total revenue and on wage, salary, and benefit expenditures in the most recent year, as well as any significant change in benefit policies over the study years. The cost estimates were developed as shown in the following section for the cost categories identified by Rosen et al⁴.

The information we needed for our analysis was contained in three sets of data, which we obtained from the HR departments:

1. Individual data on attendance at work by employees, extracted from personnel files
2. Information on the costs of morbidity- and mortality-related benefits and the costs incurred in training, recruiting, and hiring replacement staff
3. Aggregate data on workforce structure and expenditures for each study site.

(i) Attendance at work and medical care used

For each of the case subjects and comparison subjects in the study, study staff extracted the following information from personnel records:

- age
- sex
- annual salary at date of death or retirement
- assigned work unit at time of death or retirement
- cause of death or disability retirement
- dates absent from work in the previous 12 months (up to 36 months for cases, where possible) and reason for absence (sickness, training, funeral leave, etc.)
- compensation received for medical care user fees, drugs, transport, and other medical expenses, based on receipts kept in personnel files
- medical care provided by the facility in which the employee works.

Data extracted from different sources were linked by employee identification numbers. Names of employees and individual identifiers were removed as soon as the data had been entered for each employee.

(ii) Cost information

α If not treated with antiretrovirals, almost all AIDS patients die within two-three years of the onset of symptoms, with most illness and absenteeism concentrated in the year prior to death.⁵

β In order to keep their HIV status secret, employees may seek care outside normal referral channels, or not request employer reimbursement for medical bills. Some medical care costs paid out of pocket, or incurred in a Government institution, might therefore have been missed. Unreimbursed medical care costs are not actually a cost to the employer, although they are a burden on the individual. The absence of publicly incurred health care costs makes the analysis more conservative (tends to underestimate the incremental cost of an HIV infection)
Information on the costs to the corporations when an employee becomes ill and ultimately leaves the workforce due to HIV/AIDS was collected from a variety of sources:

- Files from the HR departments and the pension funds, where the average amount of retirement, death, funeral, and relocation benefits paid to the beneficiaries of employees who die in service were indicated.

- Recruitment records from the study sites, which indicated the average duration of vacancies for each category (job band).

- Our discussions with the two firms have helped us to build an estimate of training costs, based on the actual cost incurred and the experience of the HR department in managing the recruitment and training processes.

- Interviews with supervisors were used to obtain estimates of the reductions in productivity that occurred when workers were present but sick, when a position was vacant, and when a new worker was being trained. These interviews enabled us to estimate the proportion of the supervisor’s time (quantified as a proportion of salary) consumed in coping with the illness of the employee and training his replacement.

(iii) Aggregate data

Aggregate data provided by each study site includes:

- total staff expenditures for all personnel, with subtotals for regular salary, benefits (including housing), overtime pay, and compensation of medical costs.
- number of employees who left the workforce in the past 12 months or most recent calendar year for each professional job category and the reason for the termination (death, disability, routine retirement (due to age), dismissal, voluntary resignation).

**Collection and Analysis of Unit Cost Data**

All monetary data was recorded in Uganda shillings, as described below, and inflated to 2003 when the expense was recorded in a prior year. US dollar equivalents are shown using a conversion rate of 1,950 shillings to the dollar, the amount applicable at the end of 2003.

**Increased Leave and Absenteeism**

The numbers of days of sick leave, annual leave, and other types of leave (such as compassionate leave) were recorded for each case from attendance records at the job site for the two years prior to death/retirement.

The same data was recorded for each comparison for the year prior to September 2003. A tobit regression model was then used to determine the difference in the number of days of leave used by cases and comparisons adjusted for age and sex. To determine the costs
associated with the additional illness-related leave, we multiplied the days by the average total annual compensation (2003) per “comparison” worker (wage, salary and benefits divided by total employment). The comparison worker wage was recorded in 2003, and did not need to be adjusted for inflation. The amount recorded may be less than the company’s average labor costs if the sick workers are in lower paid jobs categories, and because various benefits (such as staff housing or medical care) are not included in directly attributable compensation. Total employment at the firms was generally much lower than in the South African study, so the number of cases identified was too small to permit analysis by labor category.

Our method of analysis in this study is adjusted from that used by Rosen et al in South Africa, as attendance data is not computerized in the Ugandan firms. In South Africa, the study obtained data on absenteeism for every employee, and compared cases to all other employees in the work division. In Uganda, we collected absenteeism data manually from archived attendance records for cases and comparisons.

Death and Retirement Benefits
We recorded actual cash payments made for funeral expenses, death benefits and payments to the survivors. Where such payments reflected a previous employer contribution or a return of deductions from wages or salaries, such amount (and the investment earnings thereon) was subtracted from the payments to determine the employer benefit payment. The amount of the payment was inflated from the year of the payment\(z\) to 2003 using the Uganda Consumer Price Index (“CPI”).

Where cases took medical retirement, any lump sum payment at the time of retirement was adjusted in the same manner as for death benefits. The companies studied do not make periodic pension payments to retired workers or their survivors.

Total benefit payments were averaged for the cases at each company.

Additional Medical Care
Company A provides most primary care for workers at its main plant site through an on-site clinic. This was run by company employees until September 2003, and has since been run by a medical services corporation under contract. Some referral medical care, and care for workers stationed at other locations, has been reimbursed by the company through out the period. For both cases and comparisons, we recorded medical reimbursements in the two years prior to death (for cases) and in the year prior to September 2003 (comparisons). Reimbursement for prior years has been inflated to 2003 using the Uganda CPI. We reviewed medical records for cases and controls at the plant clinic, noting the number of clinic visits in the two years prior to death (for cases) and in the year prior to September 2003 (for comparisons). The unit cost of a visit was determined by dividing annual operating cost by the total number of visits\(\ast\). The unit costs of care provided through the plant clinic was then multiplied by utilization for each

\(z\) Which could be as early as 1998.
\(\ast\) Data on monthly utilization from December 2003 to September 2004 were annualized.
case and control and added to the adjusted costs for medical reimbursement. The average difference between medical costs for cases and comparisons is used as the average incremental cost for medical care of an HIV case.

Company B switched to the use of a third party claims administrator (“TPA”) for all medical care rendered outside its industrial clinics beginning in 2002. For all comparisons, and for cases dying or retiring in the year prior to 2003, we obtained the costs of medical care recorded by the TPA for these workers. Industrial clinic records showed the number of visits made by cases (in the year prior to death) and by controls (in the year to September 2003). The annual clinic operating costs in 2003 were divided by the number of outpatient visits, then multiplied by the number of visits made by each case and comparison, to get the cost of clinic services used. To capture medical payments made for cases dying prior to September 2002, we used Company B’s accounting records, inflating these amounts to 2003 using the Uganda CPI, to estimate a cost per death. For each case and control we summed the cost of industrial clinic visits and medical claims reimbursed. The difference between the averages for cases and comparisons was used as the incremental cost of medical care for cases.

**Recruiting and Training a Replacement Worker**

Recruiting costs were an estimate by the company’s HR Department of the out-of-pocket costs of advertising and interviewing candidates, divided by the number of positions filled in a year. This unit cost was then assigned to each case.

Training costs were determined by asking HR staff to estimate the average training costs incurred for newly hired staff.

**Reduced Productivity Due to Morbidity**

The HR department identified the immediate supervisor of each case, who was then interviewed using the attached supervisor interview. The Supervisor was asked to estimate the percentage of the typical worker’s productivity displayed by the case when s/he was present for work in the last and penultimate years of employment. This percentage was multiplied by the average per worker cost in the most recent year to obtain the cost associated with this lost productivity.

**Supervisor Time (including on-the-job training)**

The supervisor interview also gave us a sense of the number of days that s/he spent managing the consequences of the illness of the case, coping with the vacancy after the death/retirement of the case and training the replacement. The number of days estimated for each case was multiplied by the average daily supervisory cost.

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* Average labor cost is obtained by dividing the total cost of wages and benefits in 2003 by the number of employees.

Daily supervisory cost determined as follows. Annual cost of wages/salary for supervisors in this work group in 2003, times fringe benefit multiplier, divided by the number of supervisors in the group and the average number of days per year actually spent at work. This was estimated by company HR personnel taking into account annual leave policy, national holidays and typical use of sick and compassionate leave by a healthy worker.
Aggregate Cost Estimates

For each company, we aggregated the cost differential between sick and healthy workers divided by the number of cases. To this, we added the results for steps 2 and 4-6, divided by the number of cases. This yields the average incremental cost of an HIV-like death or medical retirement at each company. The average incremental cost is stated as a percentage of the mean 2003 labor cost per worker for each company. The average number of cases in a year for each company is multiplied by the average incremental cost and the results are shown as a percentage of annual labor costs.

Statistical Analysis

For the analysis of absenteeism and medical care costs caused by HIV/AIDS morbidity, statistical comparisons were made between cases and comparison subjects. Since all employees are likely to be absent from work occasionally, we estimated the difference in the average number of leave days and clinic visits taken by cases and comparisons and differences in the amount of medical costs. The differences between the two groups were computed using Tobit regression analysis to adjust for demographic factors such as age, sex, years of experience and job band. All differences reported as different from 0 were statistically significant at alpha=.05. All differences that were not statistically significant were reported as 0. We also calculated the average values for all payments made for a case and report those as means.

Ethical Approval

Employee identifiers were used to access and link records on medical care, absenteeism and payments at death or retirement. Care was taken to train data collectors in confidentiality, or to use as data collectors Company employees who routinely handle confidential personnel records. The Institutional Review Boards of Boston University and Makerere University approved the study.
5. Results: The Costs of AIDS to the Labor Force

At Company A, we identified 24 cases over a 5 year period ending in 2003, an average of 1.6% of the current work force (2003) lost to chronic illness (presumptive AIDS) each year. Data was also collected on 40 comparisons matched for sex, age and job assignment. In some cases, there were not three currently employed workers of the same sex, within five years of the age of the case, and assigned to similar duties. For this reason we had an average of 1.67 comparisons for each case, instead of the target of 3.

At Company B, we identified 11 cases over 3 years ending in 2003, an average of 0.6% of the work force lost to chronic illness (presumptive AIDS) each year. Data was also collected on 31 comparisons. Larger total employment and larger work units enabled us to come closer to the target of three comparisons per case.

The observed mortality is consistent with a relatively stable epidemic and an HIV prevalence rate in the work force of 12.8% to 16% at Company A and 4.8% to 6.0% in Company B*. We did not attempt to perform seroprevalence tests on the work force at either company. However, the HIV rates estimated above are consistent with the reported nationwide ANC rate of 6.2%, particularly when one considers that Company A is located in an area with ANC prevalence significantly higher than the national average.

Increased Leave and Absenteeism

The most easily recognizable costs in the day-to-day running of the business are possible changes the absenteeism of chronically ill employees. For Company A, we found that those employees identified as cases took on average 13.23 days more sick leave than the comparisons. In the year of death, the cases took on average 8.55 days more leave. In addition in the penultimate and final years, the cases took more annual leave than the comparisons. In the final two years the cases took, on average, a total of 31.5 days more leave than the comparisons. This cost the firm 2,118,013 shillings (US$ 1,086) per worker. While these figures are not insignificant, they certainly do not reflect the dramatic difference between cases and controls that was seen in Rosen’s South African study4. It is possible that incomplete manual record keeping underestimated the differential in absenteeism.

In Company B we saw a negligible difference (only 5 days) in the annual leave and sick leave taken by cases and comparisons. This small difference results in a cost for the firm of only 522,002 shillings (US$ 268) for a sick employee. HR managers at Company B report that many employees are reluctant to stay home, even when advised to do so by a company supervisor or nurse. Where possible, the Company does assign them to lighter duties. This is consistent with the relatively low level of productivity reported for these workers in the year prior to death.

* In the absence of HAART, HIV positive patients survive an average of 8-10 years after they become infected.
**Death and Retirement Benefits**

In Company A, death in service would result in a cash lump sum payment, representing the value of the employee’s contributions, employer’s contributions and interest accrued at the date of death, payable to the beneficiaries. The company also accrues the added obligation for end of service gratuity payments as a liability in each year of employment. Retirement for redundancy or ill-health would result in similar payout from previously accrued funds. These payments are, therefore, not a cost to Company A when the worker dies. However, Company A does pay funeral benefits and family repatriation costs which averaged 452,250 shillings (US$ 232) per case.

Company B offers several payouts to beneficiaries, following the death in service of an employee. There is an extensive list of benefits described, and in practice it appeared to be applied, with payouts for gratuity linked to years of service, funeral expenses and a family relocation allowance. The average payment to cases in Company B was 1,705,801.64 shillings (US$ 875).

**Additional Medical Care**

In addition to the direct medical reimbursement costs, the cases are likely to use the company-sponsored clinic more frequently than the controls. As explained in our methodology section above, we calculated a cost per clinic visit that is then multiplied by the difference in utilization between cases and controls to determine the additional cost of treating AIDS-sick employees in the clinic system.

For Company A, the employees identified as cases were given, on average, 18,591 shillings more than the average comparison for medical costs in the year before death, and 22,135 in the year of death. This amounts to a total incremental cost of 40,726 shillings (US$ 21) per employee. Cases had 7.34 additional visits to the company sponsored medical clinic, adding 200,645 shillings (US$ 103) to the medical bill for a total incremental employer medical cost of 241,375 (US$ 124) per case.

In Company B, the onsite clinic had good records, which showed that cases visited the clinic on average 16.48 days more than the comparisons. On average in the year before death, cases also received medical reimbursements of 28,844 more than comparisons, and in the year of death, these reimbursements exceeded those of comparisons by 49,200 shillings. These amounts, when added to the cost of the additional visits to the company clinic, amounted to an average increase in medical cost of 745,022 shillings (US$ 382) for each employee lost.

**Recruiting and Training a Replacement Worker**

Company A estimated the costs associated with hiring and training a new production worker at 1,000,000 shillings (US$ 513). More senior technical staff and supervisors are sent out for commercial training courses at a cost averaging $3,000 (5,850,000 shillings). Weighting these averages by the relative numbers of staff gives an average cost for training a replacement worker of 2,600,000 shillings (US$ 1,334).
Company B gave an estimate of the recruitment costs that they are likely to incur in finding and training a new employee, summarized in the table below:

**Table 2: Recruitment and training cost estimate for Company B**

<table>
<thead>
<tr>
<th>Item/description</th>
<th>Amount (in Ugandan shillings)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertising for the position</td>
<td>1,300,000 ($667)</td>
</tr>
<tr>
<td>Salary for panelists interviewing</td>
<td>363,636 ($187)</td>
</tr>
<tr>
<td>Training for new employee (3 month course)</td>
<td>20,000,000 ($10,256)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21,663,636 ($11,110)</strong></td>
</tr>
</tbody>
</table>

Most of Company B’s new recruits are sent out of the country for training, for example even machine operators are sent away on a three month course. This explains the high training cost per recruit.

**Reduced Productivity Due to Morbidity**

Through the supervisor questionnaires, the study asked an assessment of “presenteeism”, or on-the job productivity. In this case it was asked as a percentage of the healthy job performance that the employee was able to attain after performance started to deteriorate. Through both companies, 40% of supervisors felt that employee’s performance was less than 20% of that when they were well. Although many of the supervisors reported a significant deterioration in the individual employee’s performance, 65% of the supervisors in both firms felt that their unit’s overall performance was not affected by the decrease in productivity of one member.

The average performance level of cases in Company A was 35%. Multiplied by the cost per worker, on-the-job morbidity cost the firm 9,306,000 shillings ($4,772) prior to death.

The supervisors in Company B commented on a greater deterioration, with the average performance level of chronically unwell employees perceived to be 30.5% of the healthy productive capacity of the employee concerned. If this means that 69.5% of salary is not resulting in productive labour, this costs Company B 14,158,645 shillings (US $7,261) per worker lost.

**Supervisor Time (including on-the-job training)**

75% of the supervisors interviewed across both firms said that they spent more than 30 days doing tasks that they did not need to perform when the employee was healthy.
For Company A, the average of 40 supervisor days cost of 2,445,000 (US$ 1,256) per worker lost. A Company B supervisor spending 40 days dealing with the disruption created by the ailing worker cost 2,000,078 shillings (US$ 1,026)\(^\text{\textregistered}\).

**Aggregate Cost Estimates**

For each company, we aggregated the cost differential between sick and healthy workers and divided by the number of cases. To this, we added the results for net death/retirement benefits, lost productivity, supervisor time and recruiting and training a replacement worker. This yields the average incremental cost of an HIV-like death or medical retirement at each company. The average incremental cost is stated as a percentage of the mean 2003 labor cost per worker for each company. The average number of cases in a year for each company (loss rate X 2003 employment) is multiplied by the average incremental cost and the results are shown as a percentage of annual labor costs in that Company.

**Table 3: Summary of the costs per worker incurred by Company A and B (in shillings) (Percentage of total cost per lost worker in parenthesis)**

<table>
<thead>
<tr>
<th>Cost</th>
<th>Company A</th>
<th>Company B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absenteeism</td>
<td>2,118,000 (12%)</td>
<td>522,000 (1%)</td>
</tr>
<tr>
<td>Death and Retirement Benefits</td>
<td>452,240 (3%)</td>
<td>1,706,802 (4%)</td>
</tr>
<tr>
<td>Additional Medical Care</td>
<td>241,375 (1%)</td>
<td>745,022 (2%)</td>
</tr>
<tr>
<td>Recruiting and Training a Replacement Worker</td>
<td>2,600,500 (15%)</td>
<td>21,663,636 (53%)</td>
</tr>
<tr>
<td>Reduced Productivity Due to Morbidity</td>
<td>9,306,219 (54%)</td>
<td>14,158,647 (35%)</td>
</tr>
<tr>
<td>Supervisor Time</td>
<td>2,448,709 (14%)</td>
<td>2,000,978 (5%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17,167,056 (99%)</strong></td>
<td><strong>40,796,086 (100%)</strong></td>
</tr>
</tbody>
</table>

The total for all categories of costs comes to 17.2 million shillings (US$ 8,803) per lost worker at Company A and 40.8 million shillings (US$ 20,921) per lost worker at Company B. At both companies, training of replacements and unproductive time were the biggest costs. However, the very high average training costs at Company B dominate the analysis of that firm.

\(^\text{\textregistered}\) Because of the relatively small number of supervisors interviewed, we have taken this average for all interviews and applied to the reported supervisor costs at each company.
The cost per worker lost is 120% of the average annual cost per worker for salary and fringe benefits at Company A and 185% at Company B. When multiplied by the observed rates of worker attrition due to AIDS, these costs total 1.9% of aggregate annual labor costs at Company A and 1.2% of aggregate annual labor costs at Company B.

6. Discussion

The observed rates of absenteeism may seem low, and worker loss rates are less than 2% per year. Nonetheless, the costs associated with these losses amount to 1.9% of labor costs at Company A and 1.2% at Company B. These costs per worker can be compared with the cost of HAART. In 2003, the authors recorded costs for HAART in private sector clinics in Kampala ranging from $30 to $100 per month. On September 27, 2004, a New Vision report quoted the Joint Center for Clinical Research (JCRC) in Kampala announcing that the monthly cost of generic drugs for first line antiretroviral therapy had fallen to 29,000 shillings (US$17.58). Thus, it should be possible for a motivated employer to contract for HAART care for $500 (825,000 shillings) per year. This is 4.8% of the observed costs of losing a worker to AIDS at Company A and only 2.0% of the observed costs at Company B.

In Uganda, we found a less dramatic increment in disease related absenteeism than we had expected based on our South African findings in the study by Rosen et al. This may reflect differences in record keeping: South African companies had computerized absenteeism records for all employees; in Uganda we went back to potentially less complete manual records and personnel files to retrieve this data. It is also possible that some supervisors unintentionally or otherwise did not record all absenteeism. On the other hand, our supervisor interviews indicate that sick workers were very unproductive while at work and the supervisors spent much time compensating for unwell employees. It may be that sympathetic supervisors let the worker report for duty and continue in employment, recognizing that the worker can do relatively little work. HR officials at both companies confirmed these observations. Thus, the combination of incremental absenteeism and the estimated cost of reduced productivity by sick workers may be a fair representation of the impact of the disease.

Training costs for new workers are a surprisingly large portion of the cost, particularly at Company B (53%). These companies are investing in the staff they hire, and report that they cannot usually find an individual in the Ugandan labor market possessing all the necessary skills prior to hiring. We record here only the initial investment in hiring and training a replacement worker. In fact, investments in on-going training are also lost when a worker dies, but these costs are included in total costs, and thus in the average per worker cost we use in computing lost and unproductive time.

Throughout the report to this point, we have used a currency conversion rate of 1,950 shillings per US dollar (the rate at the end of 2003) to convert observed costs, all of which were measured in 2003 or adjusted to that year using the Ugandan CPI. Due to the fall of the dollar in the last year, the exchange rate at the time of writing is 1,650 and that is used to compare to current treatment costs.
Over the last decade, both companies have downsized their work forces and contracted out some unskilled service functions (catering, security). Outsourcing also increased the average level of skill and compensation for the employees who remained on the payroll. When companies are downsizing, they hire few new workers. The average age of the work force is likely to increase, as does the seniority and experience level of the average worker. These higher paid workers have a greater cost when sick and higher benefits when they die.

Based on experience in other countries, contracting out service functions may have resulted in lowering the seroprevalence rate in the work force, since the jobs that are outsourced are usually held by lower skilled workers: a group that has shown higher levels of seropositivity in South African surveys. This would reduce the observed levels of mortality below those that would be observed if these unskilled groups were still on the company payroll. Our study provides a reasonable estimate of the burden on these particular companies, with their current work force composition, but may not be representative of Ugandan industry as a whole.

Downsizing implies that these companies were once overstaffed. If a company has excess workers, the costs we measure here may be an overstatement of the true costs of the disease. Other workers already on the payroll pick up the slack when the worker is absent or not working to full capacity. The dead worker may not be replaced; supervisors did report that not all vacancies resulting from the death of a case had been filled. The total labor costs of the company may not actually rise to the extent that we estimate. However, in a company that is efficiently staffed on the expectation of a healthy work force, these estimates are a more accurate indication of the extent to which labor costs will be increased by AIDS. If downsizing has now run its course at Companies A and B, these estimates more accurately reflect the additional costs these firms are incurring because of the disease.

7. Conclusion

Although the nationwide HIV infection rate, as measured by antenatal surveys, has been falling, Uganda employers still incur a significant cost from the disease. The two companies studied are losing 1.6% (Company A) and 0.6% (Company B) of the current work force to AIDS-like illness. The measured costs associated with the loss of a worker were 17,167,056 shillings (US$ 8,804) at Company A and 40,796,086 shillings (US$ 20,921) at Company B. These observed costs are equal to 120% of the average annual cost (salary and fringe benefits) of a worker at Company A and 185% at Company B. The estimated AIDS related costs are 1.9% of the annual total for compensation and fringe benefits of all employees at Company A and 1.2% at Company B. HAART, now available in the private sector in Kampala for around 825,000 per year, is 4.8 % of the cost of losing a worker to AIDS at Company A and only 2% of the cost of losing a worker to AIDS at Company B. If HAART is effective in keeping an HIV positive worker productively employed, the recent decision by both companies to offer HAART
to their workers is an investment well supported by the costs of AIDS estimated in this study.
8. References


