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IMPACT OF ART ON EMPLOYER COSTS RELATED TO AIDS

HEALTH INITIATIVES FOR THE PRIVATE SECTOR (HIPS) PROJECT

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EXECUTIVE SUMMARY

Some employers in Africa were pioneers in offering antiretroviral therapy to their HIV positive workers, doing so prior to the availability of such treatment in the public sector. In Uganda, a number of large employers are now providing antiretroviral therapy (ART) in company clinics, or paying for treatment in the private sector. Such treatment should provide a benefit to the employer, reducing the costs associated with employee death or medical retirement as a result of AIDS. But few studies have been done to measure this hypothesized reduction in disease related costs.

In this study, we are able to make a direct analysis of the effects of company sponsored ART. In 2004, Boston University School of Public Health completed a study of the costs of chronic disease related attrition in two Uganda companies over the preceding five years. One of those companies (Company A) began ART for its workers soon after the study was conducted, and has now been offering treatment in its company clinic for five years. By returning to Company A and applying the same method of quantifying chronic disease related costs, we are able to examine the change in costs which accompanies the provision of ART.

The changes are dramatic. Twenty four workers were lost to chronic disease (generally death due to AIDS) from 1998 through 2003. In the five years since, with ART available at the company clinic, only four workers have been lost. The chronic disease attrition rate has fallen from 1.6% of the work force each year to 0.27% of the work force. This lower rate is probably close to that which would be observed in the absence of the AIDS epidemic.

Using the methods from the earlier study, we measured the costs associated with the loss of the four workers in the post ART period. Estimates include increased absenteeism and medical care costs, death benefits, hiring and training of replacement workers, supervisory time and the decline in productivity while the sick worker remains on the payroll. The costs observed, per worker lost, were approximately 15.5 million Ushs. But, because of the radical decrease in mortality, attrition related costs at Company A have fallen from 1% of annual labor costs to 0.11% of annual labor costs, a reduction of nearly 90%.

Company A reports that it is spending about 763,000 Ushs per year (\$363) per worker receiving ART, an amount similar to that reported in other studies of treatment costs. Twenty four workers are now receiving ART, a number similar to the observed reduction in worker mortality. Even if we combine the costs of treating these workers with the remaining costs of chronic disease attrition, the total is less than 0.6% of annual labor costs—a reduction of 40% from the costs that Company A incurred when the AIDS epidemic was untreated.



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I am extremely grateful to the Research Assistants: Ismail Ddumba Nyanzi and Arthur Musasizi, who carefully and untiringly collected the data used in this study. Special thanks go to Mr. Ismail Ddumba Nyanzi who in addition to data collection made an input in the report writing process. Last but not least, I would like to thank Dr. Margaret Banga for her role in data analysis processes.

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1. INTRODUCTION/BACKGROUND

In 2004, Boston University Center for International Health and Development issued a report on the cost of chronic illness at two Ugandan employers¹. The report methodology was based on that developed by Rosen et al., (2000)² and applied in a published study of several large firms in southern Africa. The company in which the present study was conducted was referred to as Company A in the previous report.³ Over the study period analyzed in the Boston University report, approximately 1.6% of the company work force (in 2003) died annually due to chronic disease. Costs associated with these deaths were approximately 1% of total labor costs at the company.

Average costs associated with each death (at 2003 prices and exchange rates) were \$4,600. Shortly after data collection for the Boston University report, Company A began offering antiretroviral therapy (ART) to its employees and dependents at a company clinic. Company A reports that employee deaths have decreased since the company began offering ART--both in Uganda, and at other facilities it owns in sub-Saharan Africa. To provide a better understanding of the benefits to the employer that offers ART, in this study we calculate the costs associated with employee deaths and medical retirements since ART began at Company A and compare with the costs reported in the previous study. This will allow the company to make an internal comparison of the costs and benefits of the treatment program, and will permit the HIPS project to report any savings realized by an (anonymous)⁴ Uganda company that provides antiretroviral treatment for its workers.

The intent of the current study is to reproduce this analysis for the years since that baseline study was carried out (in 2004), which ended prior to the introduction of ART for the company employees at the company clinic. We hypothesized that the same methodology applied to data from these more recent years will show a reduction in the costs attributable to AIDS related morbidity and mortality and absenteeism in the work force.

The study was designed on the assumption that data on absenteeism, attrition and medical costs will be available from files maintained by the company or medical records maintained by its medical contractors. To accomplish this study, information on the total employment and employment related costs was required in order to calculate the costs of time lost or productivity reduced due to illness. The company would also supply updated estimates of the costs of hiring and training replacement workers. The study would also rely on data from interviews with the supervisors of deceased workers to identify costs of reduced productivity and supervisor time spent “managing around” the loss of a worker and training a replacement.

¹ Feeley F, Bukuluki P, Collier, A, Fox, M. The impact of HIV/AIDS on productivity and labour costs in two Ugandan corporations. 2004 October.

² Rosen S, Simon JL, Thea DM, Vicent JR. Care and treatment to extend the working lives of HIV-positive employees: Calculating the benefits to business. South African Journal of Science; 96(6):1- 5. 2000 June.

³ Feeley F, Bukuluki P, Collier, A, Fox, M. The impact of HIV/AIDS on productivity and labour costs in two Ugandan corporations. 2004 October.

⁴ The company accepted to participate in the study on condition that any information circulated out of the company would not bear its name. We therefore maintained the label company A, that we also used during the 2003 study carried out by University of Boston in collaboration with Makerere University.



1.1. STUDY DESIGN AND OBJECTIVES

Objectives

The main objective of the study was to quantify the annual costs associated with the death or medical retirement of company employees due to chronic disease since the introduction of antiretroviral therapy for employees and dependents in 2004. These results can be compared with the similar costs calculated for the same company in a USAID funded study (undertaken by Boston University and Makerere University) covering five years ending September 2003, a period prior to the availability of ART. The study hypothesized that there will be a marked reduction in such costs which is likely attributable to the introduction of ART for employees and dependents. Any such reduction can be compared by the company to the incremental costs it is incurring for the ART benefit.

It was anticipated that the results will be used by the HIPS Project to show Uganda employers the kinds of savings achievable by making available employer sponsored ART. Company A may also want to supplement the data for this study and perform an analysis of the pattern of absenteeism in employees going onto ART.

1.2. DATA COLLECTION AND ANALYSIS

All data on costs was recorded in Uganda shillings. An exchange rate of 2100 Uganda shillings to a US dollar, in effect at the time of data collection (May 2009), is used throughout. No personally identified data was provided to HIPS. However, the company maintained a link to identifiers in case questions arose during the input and analysis of the data. HIPS, with assistance from researchers based at Makerere University, worked together with company staff to develop simple procedures for collecting these data elements that are consistent with normal record keeping at the company. The following sections describe how each element of cost associated with employee attrition was calculated.

1.2.1. Costs of Incremental Sick Leave

A case/control method was applied. Each lost employee (case) was matched with three employees (controls) still in service. In total, four cases were identified and three comparisons were selected for each case. This means that we had four cases and 12 comparisons. The amount of sick leave and general leave taken by the “case” in the 24 months prior to death/retirement is compared to the average amount of leave taken by controls in a similar period. The net increase in the number of days of sick leave and other annual leave taken by the case was calculated. This increase was averaged over all case/control pairings and multiplied by the current average daily compensation in the company to determine the cost per case.

1.2.2. Incremental Costs of Medical Care

The case/control method was again used. Over the 24 months prior to death/retirement, the medical reimbursements made for “case” employees were added to the cost of the clinic visits made by the case and the cost of drugs dispensed to him/her. The difference between these costs and the average of medical costs in the same categories incurred for the “control” employees (most recent year multiplied by 2) was taken to be the incremental cost of medical care provided to the case.

1.2.3. Funeral, Death and Retirement Benefits

Death, funeral and retirement benefits paid on behalf of cases were divided by the total number of cases to obtain the average of benefit payments per case. Excluded from this calculation are any amounts paid



from insurance policies or contributory retirement or pension plans. Only amounts specifically tied to the death/retirement of the case and paid from the current year budget were included.

1.2.4. Training and Recruiting Costs for Replacement of Lost Employee

These are the average costs associated with the filling of one vacant position. The costs were estimated by the company Human Resources Department and included:

- Cost of advertising for one position
- Cost of screening all candidates for one position
- Average cost of pre-service training, including tuition and in house training courses, for a new employee. Excludes the costs of on the job training

1.2.5. Supervisory Costs Associated with Loss of an Employee

Supervisors of each case employee were interviewed to determine: the amount of time spent by the supervisor in “managing around” the illness and loss of the case employee. The number of days was multiplied by the average supervisory wage. To assure comparability between studies supervisory wage was determined by multiplying the average worker wage times the same supervisory multiplier (3.2) used in the previous study.

1.2.6. Lost Productivity (“Presenteeism”)

This was also based on interviews with the supervisor of each case employee. It included:

- The length of the period prior to death/retirement when the employee’s performance at work notably deteriorated
- The percent reduction in productivity of the case when s/he was at work during this period. This excluded the loss of productivity due to absenteeism

The average performance level of cases was multiplied by the average per worker cost in the most recent year to obtain the cost associated with lost productivity.

1.3. DATA ANALYSIS

Analysis was conducted by the HIPS project using a modification of the spreadsheets developed for the original study. As necessary, regression analyses were conducted to determine the difference between case and control values for days of sick leave and total days of leave. Statistical comparisons were made between cases and controls in respect to sick leave days, total leave days and amount of medical costs.

1.4. ETHICAL ISSUES

The HIPS project did not receive individually identified data, and the study is largely based upon data collected by the company in the normal course of business. All the data collection was done within the company and files of employees did not at any moment leave the company premises to ensure confidentiality. Employees selected as cases or controls were not directly interviewed; only their files were reviewed. Data collectors were trained in issues of confidentiality. Employee identifiers and personal file numbers were used by the research team to interview supervisors about cases and comparisons and to access and link records on medical care, absenteeism and payments at death or



retirement. The supervisors could easily associate personal file numbers/identifiers with the respective cases and controls. All data collected or abstracted by the researchers was stored using a unique number assigned for purposes of this study and cannot be related back to individual identifying information. In keeping with the agreement between the researchers and company management, the company is not identified in this report, and is again referred to as “Company A.”



2. RESULTS: THE COSTS OF AIDS TO THE EMPLOYER

This section presents findings from the study on the impact of ART on employer costs related to AIDS in a large manufacturing company. An attempt is made to compare the costs of the current study with those from a similar study carried out in 2003 at the same company.

2.1. INCREASED LEAVE AND ABSENTEEISM

Survey results indicate that employees, who were identified as cases, incurred, on average, 82 days more sick leave than the comparisons during the last two years of life. In the final two years the cases also took, on average, a total 78.6 days more total leave (sick and annual) than the comparisons. This costs the company Ushs1,709,924 (US\$ 814) per worker. The results are similar to findings from studies carried out elsewhere which reveal higher level absenteeism among People Living with HIV and AIDS⁵.

2.2. ADDITIONAL MEDICAL CARE: INCREMENTAL COSTS OF MEDICAL CARE

Data generated shows that “case” employees used the company-sponsored clinic more frequently than the comparisons/controls. In addition, the company on average incurs significantly higher medical reimbursement costs for case employees than comparisons. The total incremental cost of medical care, calculated using the case/control method, was found to be Ush 448,262 (US\$ 213) per case.

2.3. DEATH AND RETIREMENT BENEFIT

Death in service results in a cash lump sum payment, representing the value of the employee and employer’s contribution to the National Social Security Fund and the interest accrued at the date of death, payable to beneficiaries. The company also accrues the added obligation for end of service gratuity payment as liability in each year of employment. Retirement for redundancy or ill-health results in a similar payout from previously accrued funds. These funds are therefore not a cost to the company. Nonetheless, the company incurs, on average, funeral benefits and family repatriation costs, amounting to Ushs 2,075,000 (US\$ 988) per case

2.4. RECRUITING AND TRAINING A REPLACEMENT WORKER

The cost incurred in the finding and training of a new employee is summarized below. It is however important to note that new production workers cost, on average, less than the more senior technical staff and supervisors. The average training cost is therefore derived by weighting the averages by the relative number of staff. Like many employers in Africa, Company A now outsources a number of low skilled jobs such as security and catering. As a result, the work force has a large percentage of skilled blue collar or white collar workers, and less skilled production workers receive substantial training. This employment profile tends to explain relatively high recruitment and training costs that might not be experienced in a workforce with a different skill profile.

⁵ Rosen S, Simon JL, Thea DM, Vicent JR. Care and treatment to extend the working lives of HIV-positive employees: Calculating the benefits to business. *South African Journal of Science*; 96(6):1- 5. June, 2000.



Table 1: Costs Associated to Recruiting and Training Replacement Worker

Item/Description	Year ending Dec 31,2007	Year ending Dec 31,2008
	Amount (In Uganda Shillings)	
Advertising cost for one vacant position (EXTERNALLY)	1,500,000 [\$714]	1,500,000 [\$714]
Interviewing and selection costs for all candidates for one position	1,000,000 [\$476]	1,000,000 [\$476]
Average cost of training one new employee	2,045,429 [\$974]	2,824,143 [\$1345]
Total	4,545,429 [\$2,164]	5,324,143 [\$2,535]

2.5. SUPERVISORY COSTS ASSOCIATED WITH LOSS OF AN EMPLOYEE

On average Supervisors take 42 days “managing around” the illness and loss of case employees (including rescheduling of workers, and on the job training of a replacement) and/or doing tasks that they did not perform when the employee was healthy. The average of 42 supervisor days cost the company Ushs 2,923,840 (US\$1,392) per-worker lost. Using the “supervisory multiplier” of 3.2 from the previous study, supervisor compensation cost the company 69,615 Ushs (\$33.15) per day. The supervisory costs were calculated by multiplying the number of days (42) with the average daily supervisory wage.

2.6. LOST PRODUCTIVITY (“PRESENTEEISM”)

Using the supervisor questionnaire, the study estimated the average percent reduction in productivity of the case for the period prior to death, when the employee’s performance at work began to deteriorate. The study showed that the “case” employees’ productivity in the last 2-4 months prior to death/retirement fell nearly to 61% of that when they were well. The on-the-job-morbidity cost the company Ushs 3,041,345 (US\$1448) per worker, prior to death.

In the recent past, rather than terminate/retire the chronically ill employees, Company A has devised more creative means of utilizing them, albeit at a cost to the company. This involves moving them from strenuous to less strenuous jobs or creating new jobs for them within the plant matched to their physical and health condition. One employee was moved from a position where he used to earn Ushs.164,760 (US\$ 78) to a new position in which he earns Ushs.313,817 (US\$ 149). This followed the introduction of the HIV/AIDS workplace policy, which protects employees living with HIV and AIDS. This however, does not and should not imply that chronically ill workers, who are moved on to less strenuous jobs, necessarily take up positions in which they are more highly remunerated. Rather, it could have been that this was the only available (vacant) position at the time of redeployment. The new salary for the transferred employees is based on the salary structure within the department in which they are transferred, and could decrease as well as increase. As a result, we did not take any change in the remuneration received in a less strenuous position as a cost associated with the illness of the case.

2.7. COSTS PER-WORKER LOST

The total for all categories of cost comes to 15.52 million shillings (\$ 7,392) per lost worker. Hiring and training of replacements is the largest element of cost, followed by supervisory time and lost productivity



Table 2: Summary of the Costs per Worker Incurred (in Uganda Shillings)
(Percentage of the total cost per lost work in Parenthesis)

Costs	Amount (Ushs)	%
Absenteeism	1,709,924	(11%)
Death and Retirement Benefit	2,075,000	(13%)
Additional Medical care	448,262	(3%)
Recruiting and Training a Replacement Worker	5,324,143	(34%)
Supervisor time	2,923,840	(19%)
Reduced productivity due to mortality	3,041,345	(20%)
Total	15,522,514	100%

3.0. ATTRITION RATE

For the five year period ending 2008, only 4 cases were identified. This is much lower than number of cases (24) identified during the previous study over the five year period ending 2003 when the company did not offer ART. The four cases identified in this study represent an annual death rate of 0.27% of the work force, which is probably close to the underlying death rate without AIDS. This is significantly lower than the 1.6% chronic disease mortality rate identified in the study done in 2003. Even if the cost of chronic disease attrition is combined with the cost of treating workers on ART, the total is less than 0.6% of annual labor costs—a reduction of 40% from the costs that Company A incurred when the AIDS epidemic was untreated.

4.0. AGGREGATE COSTS OF CHRONIC DISEASE ATTRITION

The costs of losing a single worker have risen somewhat since the earlier study, from 8,9740,000 Ushs to 15,522,514 Ushs. But five years have passed since the earlier study, and inflation in Uganda explains much of this increase.⁶ In addition, employees whose disease is partially controlled may remain in employment longer, thanks in part to Company A's HIV/AIDS policy as well as the longer life expectancy possible with partially effective treatment.

Employee attrition has dropped dramatically—from 1.6% of the work force per year to 0.27% per year. As a result, the costs associated with chronic disease attrition are now only 0.11% of Company A's aggregate annual labor costs.

5.0. DISCUSSION AND CONCLUSIONS

The study demonstrates the extent to which chronic disease illness and death of employees affect the enterprise by both decreasing production and increasing expenditures. This is due to the increased levels of labour absenteeism, less productivity due to ill health, higher recruitment and training costs, and the incremental costs of medical care as shown above. The study however reveals a major reduction in HIV/AIDS related mortality and retirement since the outset of the ART programme at Company A, with attrition related costs reduced from 1% of total labor costs to 0.11% of labor costs.

⁶ The current (as of September 2009) headline inflation rate is 14.5 percent according to the Uganda Bureau of Statistics.



Company records indicate that 24 employees and 17 dependants respectively are now on the ART program. Most of these employees would likely have died by the time of this study in the absence of ART. The number (24) is close to the net decrease in chronic disease attrition between the two five-year periods (from 24 to 4). If these workers had died, the company would have incurred attrition related costs similar to those observed in the earlier study. Thus the provision of ART and treatment for opportunistic infections of employees living with AIDS has helped to avert a significant cost. The annual unit cost per client on the ART program is Ushs. 763,000 (US\$ 363)⁷. Given the number of employees on ART, this treatment costs the company in total about Ushs 18,312,000 (\$8,720) annually (Ushs763,000 x 24), equal to about 0.48% of the total annual labour costs. So the costs of employee treatment plus remaining attrition costs are 0.6% of labor costs, only 60% of the attrition costs prior to treatment.

One cost factor not considered in this analysis is the possibility that those who are on treatment and remain in service have higher rates of absenteeism. However, studies conducted on Kenya tea plantations (see Larson, 2007:13)⁸ and Botswana diamond mines show that worker absenteeism and/or productivity returns to near normal levels after successful initiation of ART. Company A may want to conduct a study among workers on ART to determine if there is any variation from normal absenteeism rates once workers are stable on first line therapy.

⁷ HIPS (2009). Development of Case Rates for HIV Treatment and care at certified Private Clinics, Draft Report

⁸ Larson, B. A *et al.*(2007). Antiretroviral therapy and presenteeism: Preliminary results from a cohort of Kenyan Agricultural workers. Available at <http://www.aaid.org/docs/Paper%20Bruce%20Larson.pdf> [Accessed on 29th September 2009]