

# Investing in the Epidemic: the Costs of AIDS and the Benefits of Interventions

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# Overview of Presentation

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- Introduction and methods
- Results 1: Costs of HIV/AIDS to employers
- Results 2: Benefits and costs of interventions
- Conclusions

# Introduction

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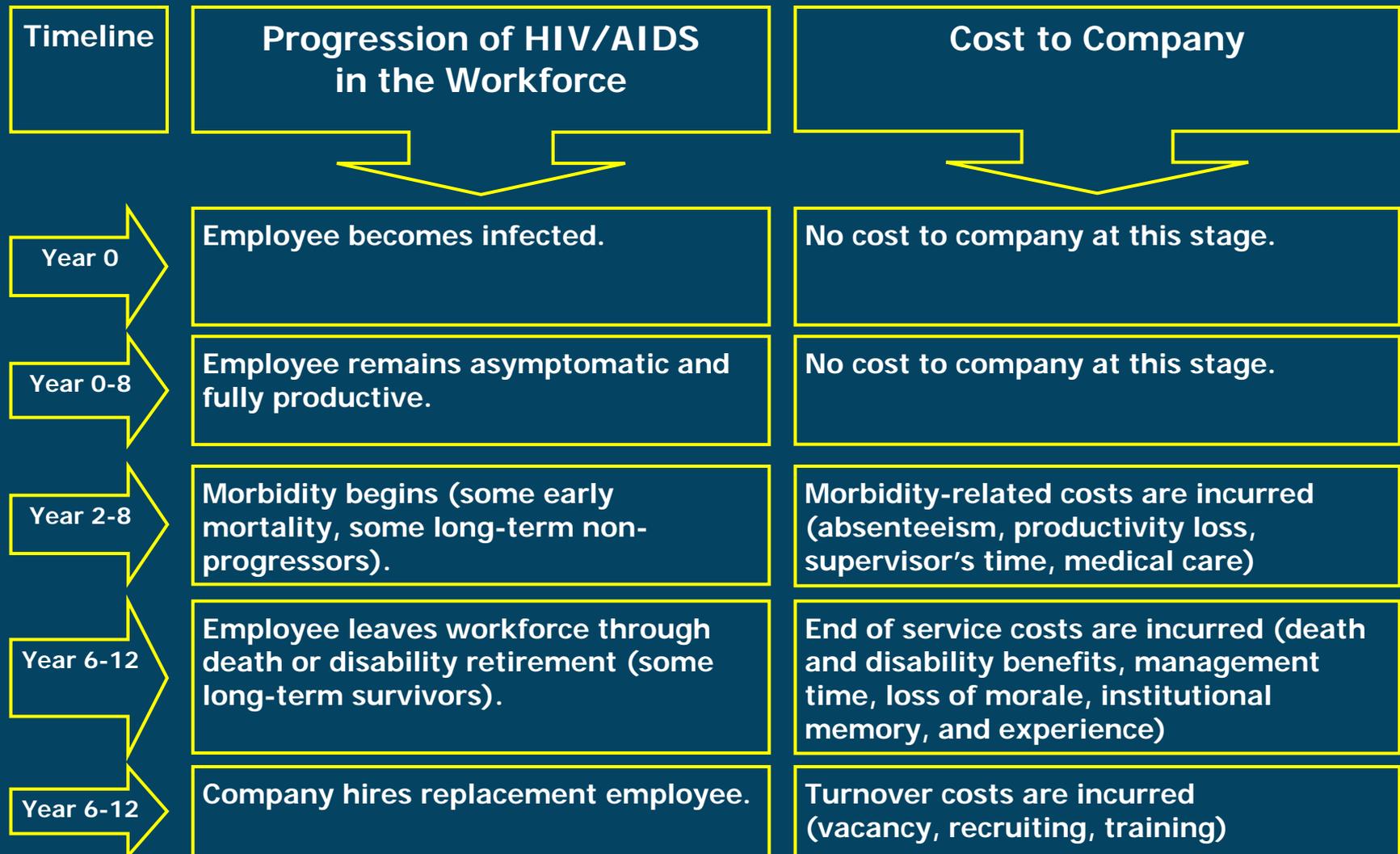
- Research questions
- Analytical framework
- Companies in the study

# Research Questions

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1. What is the cost to an employer of an HIV-positive employee at each level of the workforce?
2. Is there is a financial incentive for employers to invest in prevention and treatment?

# Timing of Cases and Costs



# Analytical Framework

## *Direct Costs*

## *Indirect Costs*

*From one  
employee with  
HIV/AIDS  
(individual)*

- Benefits payments
- Medical care
- Recruitment and training of replacement worker

- Reduced on-the-job productivity
- Increased absenteeism
- Supervisor's time
- Vacancy
- Lower productivity during replacement's startup period

*From many  
employees with  
HIV/AIDS  
(organizational)*

- Insurance premiums
- Accidents due to ill and inexperienced workers
- Litigation over benefits, dismissals, etc.

- Senior management time
- Production disruptions
- Loss of workforce morale
- Loss of experience and institutional memory
- Reduced returns to training investments
- Deteriorating labor relations

Measured  
Unmeasured

**Total Cost to Firm of HIV/AIDS in the Workforce**

# Basic Methodology

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- Collected detailed data from companies on workforce, costs, HIV prevalence.
- Estimated present value of costs associated with individual case of HIV/AIDS at each level of workforce.
- Multiplied present value per infection by projected number of infections (aggregate analysis not presented here but included in paper).
- Modeled effectiveness and costs of interventions using parameters from the literature.

# Companies in the Study

Site	Co. A	Co. B	Co. C	Co. D	Co. E	Co. F
Sector	Heavy industry	Agric.	Mining	Mining	Retail	Media
Location	South Africa	KwaZulu Natal	Botswana	KwaZulu Natal	KwaZulu Natal	South Africa
Size of workforce	>25,000	5,000-10,000	500-1,000	500-1,000	<500	1,000-5,000
Est. HIV prevalence	8.8% (1999)	22.9% (1999)	31.6% (2000)	24.0% (2001)	7.9% (2001)	10.2% (2001)

**Assumptions:**      *Discount rate: 7% (real)*  
*Median survival time: 9 years*

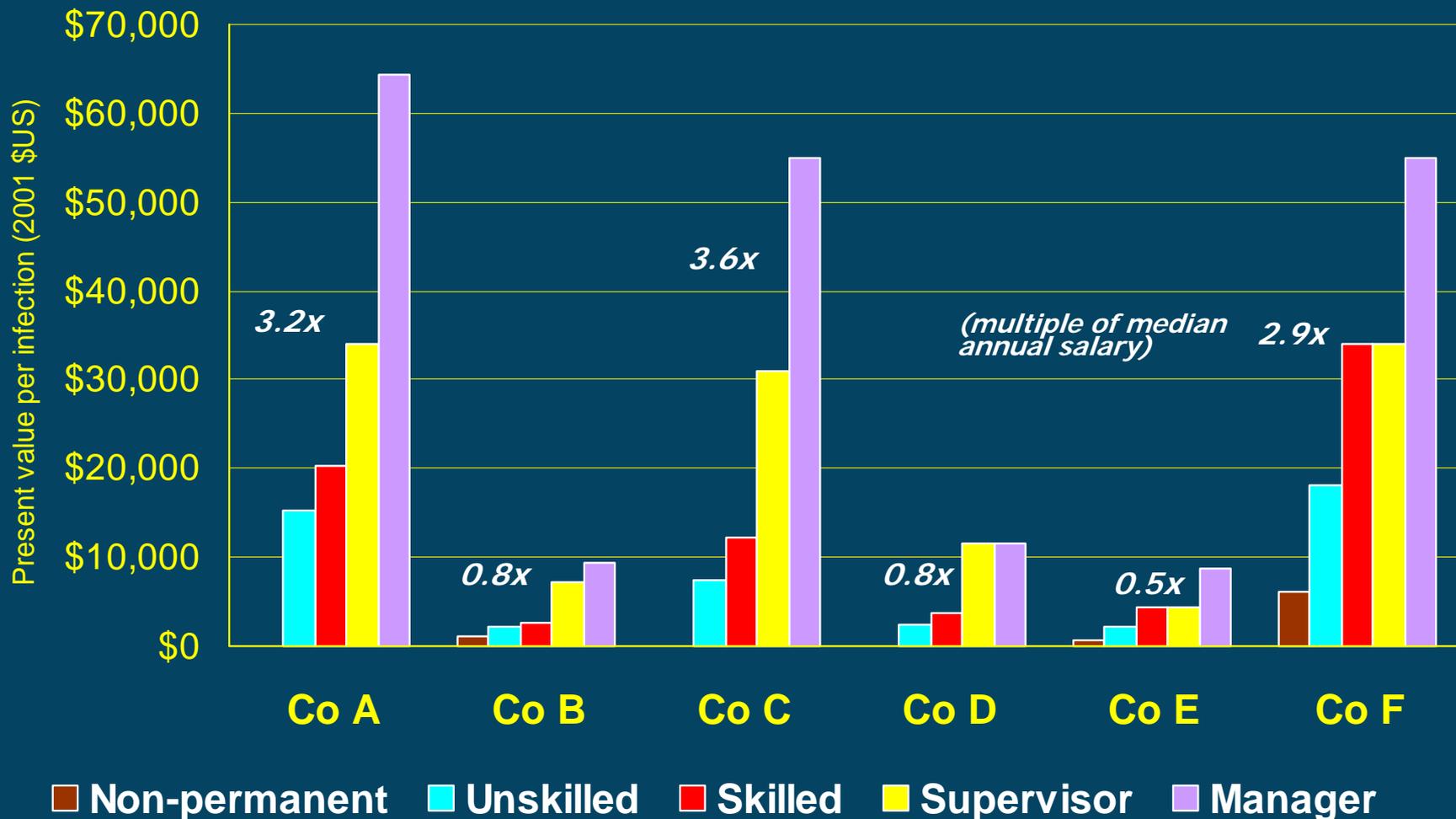
# Results 1: Cost Per Infection

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- Cost estimates
- Productivity results
- Why do the costs vary so much?

# Cost Per Incident HIV Infection

Males, aged 35-49



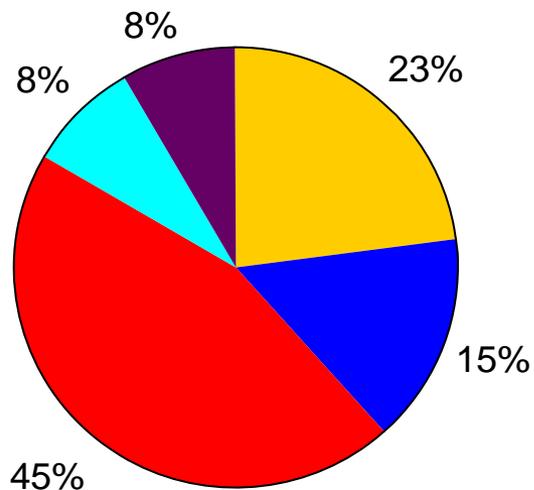
# Productivity Results

Type of cost	Source of data; method	Mean	High	Low
Sick leave (days)	Human resource database; estimated difference in leave used by current employees and by employees who died or went on disability in last year of service.	35	68	11
Loss in productivity when at work (% of full productivity)	Questionnaires to supervisors of employees who died or went on disability; estimated magnitude and duration of reduction in employee's performance.	38%	63%	22%
Supervisor's time required (days)	Questionnaires to supervisors of employees who died or went on disability; estimated own use of time in employee's last year of service.	14	25	7

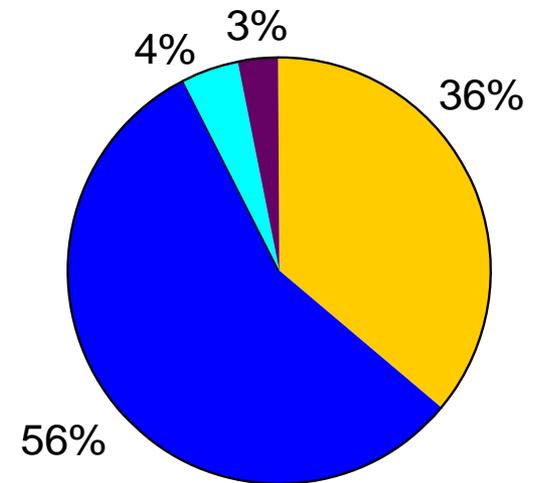
# What Accounts for Differences in the Cost Per Infection?

Variable	High-cost firms	Low-cost firms
<i>Most important:</i>		
Type and level of death and disability benefits	Defined benefit pension; risk benefit levels stable	Premiums capped; risk benefit levels falling
<i>Other differences:</i>		
Medical care	Medical aid coverage for all employees	Most use company clinics and public hospitals
Status of unskilled workers	Permanent employees with full benefits	Many are contractors with few benefits
Salaries (labor productivity)	Higher, so absences and turnover cost more	Lower, so absences and turnover cost less

# Distribution of the Present Value of an Incident Infection



Company A



Company B

# Results 2: Returns to Investment

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- Prevention
- Treatment

# Investing in Prevention

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There is a financial case for an employer to invest in HIV prevention activities if:

The savings from postponing the impacts of an infection for one year

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The cost of averting that infection for one year

*= cost per infection -  
cost per infection/(1+r)*

*= cost of prevention program  
per year/number of infections  
prevented per year*

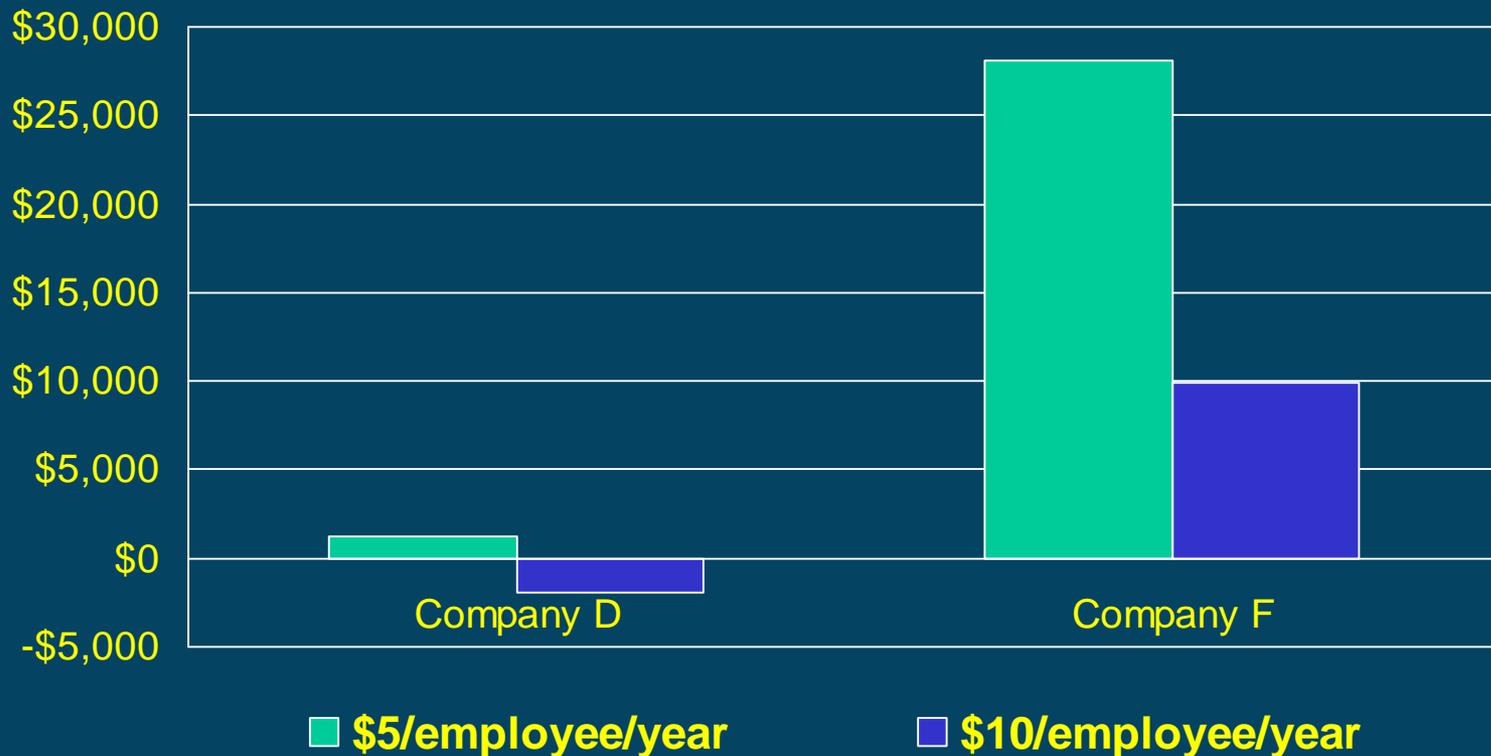
## **NB:**

- 1. The cost of the prevention program is incurred this year and every year; the benefit is accrued far in the future and may not be captured by the current employer.**
- 2. Prevention programs are usually delivered to populations, not individuals.**

# Net Benefits of Prevention Companies D and F

- For an HIV prevention program that:
- Reduces HIV incidence by 50%
  - Is provided to the entire workforce
  - Costs the amount shown/employee/year

The net present value (return) to the employer for the whole workforce would be:



# Investing in Treatment

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There is a financial case for an employer to invest in HIV/AIDS treatment if:

The savings from postponing the impacts of HIV/AIDS morbidity and mortality for X years

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The cost of care and treatment for X years

*= cost per infection - cost per infection / (1+r)<sup>X</sup>*

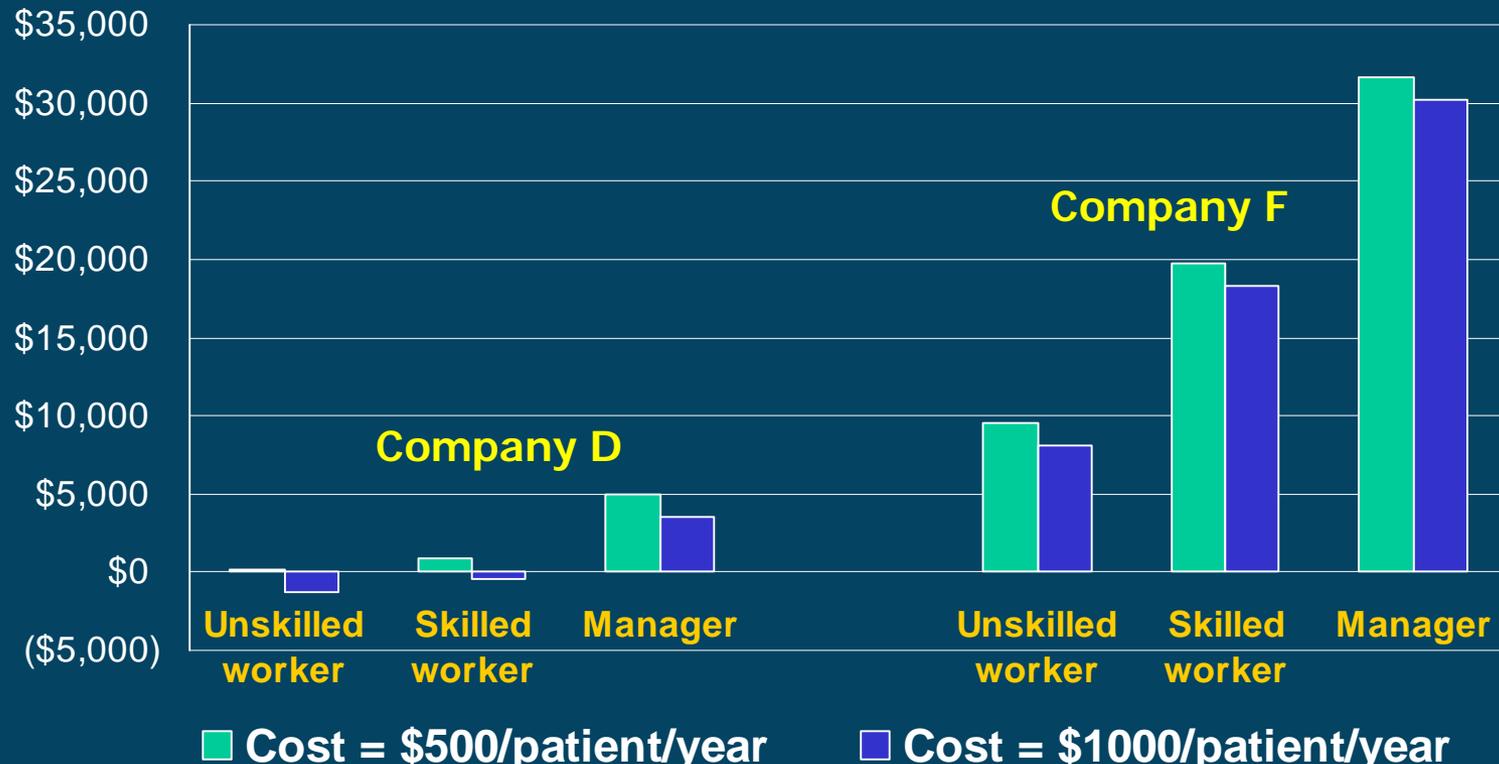
*= PV of [(cost of VCT + pre-ARV care + ARVs) - costs of ARV-related morbidity]*

# Net Benefits of Treatment Companies D and F

For a treatment program that:

- Starts in year 8 for all patients
- Extends working life by 5 years average
- Has no associated morbidity
- Costs the amount shown per patient per year

The net present value (return) to the employer per employee treated would be:



# Equity Implications of the Financial Case for Treatment

If treatment cost \$717/patient/year, the NPV to Company D would be  $\approx$  \$0 (i.e. break even). But:



→ Treatment is likely to be a profitable investment for Company D, but financial considerations alone would not produce an equitable outcome.

# Conclusions (1)

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- The cost to an employer of HIV/AIDS is  $\approx 0.5$ - $4.0$  x the affected employee's annual salary.
- The variation stems mainly from differences in employee benefits.
- These results are based on conservative assumptions, and they exclude all of the "organizational" costs of HIV/AIDS.

# Conclusions (2)

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- There is probably a financial case for employer investments in prevention, but:
  - Data on effectiveness are lacking
  - Benefits may not be captured by the employer
  - Results are sensitive to the cost of the prevention program.
- There is clearly a financial case for investing in care and treatment for many organizations, even though:
  - Data on effectiveness are lacking, especially for long term
  - Too early to know true costs of workplace programs.

# Conclusions (3)

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- HIV/AIDS programs have many other benefits, such as:
  - Retaining experience and institutional memory
  - Strengthening employee morale and discipline and improving labor relations
  - Maintaining social stability in the surrounding community
  - Maintaining shareholder confidence.
- Employers are systematically under-investing in HIV/AIDS programs. They will have positive financial, social, and ethical returns for many (perhaps most) organizations.

# Research Agenda

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- Effectiveness and costs of workplace interventions.
- Measurement and valuation of productivity (threshold effects, critical paths, coping strategies).
- Application of methodology to public sector agencies.
- Implications of findings for public policy.
- Public debate on optimal allocation of economic burden of HIV/AIDS among public sector, private sector, and households.