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FORETHOUGHT RISK MANAGEMENT

Cutting the Cost of HIV

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Companies doing business in the developing world have to contend with the staggering human and financial costs of HIV infection—and most would agree that conventional approaches to controlling the epidemic aren't working. In our experience in the labor-intensive mining industries of Russia, South Africa, and Botswana, we've seen infection rates among workers exceeding 90% in extreme cases and productivity losses as high as 30%. Efforts to prevent the spread of HIV infection have been only modestly effective, and so treatment is vitally important. But antiretroviral therapies and their associated health maintenance programs are extremely expensive. In our work with the largest mining companies in the world, we've found few that can afford to fund the total lifetime cost of treating workers—which can range from $400,000 to $900,000 per person.

Indeed, the root constraint for companies trying to manage HIV, we believe, is not the inadequacy of therapies or education, but cost. Therefore, we have approached the epidemic purely as a financial problem rather than a medical one. In pilot programs in Russian and Botswanan mines, we have lowered costs, reduced absenteeism, increased treatment, and improved productivity by applying the principles of capital-asset portfolio modeling to treatment programs and then creating contracts that allow companies to trade away (or insure against) the remaining financial costs of HIV on their business.

Here's how we did it: In step one, we created financial models of thousands of possible HIV management programs, each with different permutations of the elements constituting a complete program, from medications and treatment delivery to health facilities and ongoing wellness plans. Each such program is a possible treatment portfolio. Thus, portfolio A might consist of importing 2,000 capsules of drug A from India at a fixed contract price; importing 1,000 capsules of drug B from Belgium at market price; building five HIV/AIDS clinics owned and managed by the mining company; employing all nurses from company X; and giving each patient one of each pill once a day. Treatment portfolio B might be similar but require building fewer clinics while outsourcing for the remainder. Portfolio C might consist of outsourcing all treatment to managed health care company Y for a total fee of $10 million—and so on. (The actual portfolios we modeled have many more variables than described here and make forward projections.)

By running computer simulations of myriad different combinations of drugs and services, treatment locations, costs, and many other factors over time, we estimated the total costs and benefits (in terms of productivity and revenue) for the different portfolios. We then plotted the standard deviation of costs (the risk) versus the mean costs of treating employees (the "return") for each portfolio by averaging the outcomes of thousands of possible simulations run on each of them. The optimal portfolio for a given company, then, is the one that generates the highest likely return at an acceptable risk level. (This work required formidable computing power; a single portfolio would call for at least eight hours of processing on a laptop.)

While our method was initially greeted with skepticism, the technique generated significant positive financial and health results in both pilot locations. Over a two-year period, the companies' total treatment costs fell by approximately 30% to 40%—more than the simulations had predicted. In both of the pilots, the combined treatment costs fell from $1.2 billion to $800 million. At the same time, absenteeism rates fell by 7% and 15%, the number of employees enrolled in treatment programs increased by 24% and 36%, and CD4 T-cell count among HIV-infected workers (an indicator of immune-system health) rose by 25% and 34%. Although location and type of mining does play a role in overall costs in our models (because labor costs vary), the single most important variables in our cost models are the source and price of drugs.

In step two of our program, we created

instruments for trading risk. We devised a health derivative—in a sense, a sort of insurance contract—that an investment firm could sell to mining companies to buffer them against the potential productivity losses due to HIV. The contract states that if HIV-related absenteeism and injury were to affect productivity in specific ways, the investment firm—which receives a premium from the covered company—would pay the mining company a predetermined amount. If productivity is not affected, the investment firm would retain the premium as income. In essence, the contract allows the mining companies to shift the cost risk of HIV from themselves to a speculator (the investment firm). This investor is betting that a given portfolio will keep the cost of HIV-related productivity losses below the amount of the premium. Companies like Harmony Gold are taking this concept further, investigating the feasibility of contracts tied to individual mine shafts.

The positive results described here are based on trials in one industry. However, these pilot programs should offer hope to corporate leaders in other industries who are seeking ways to affordably—and effectively—care for their HIV-infected employees and limit the negative impact of HIV on their businesses.

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