The Impact of Human Immunodeficiency Virus/AIDS

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As researchers, why do we study socioeconomic impact? For one, to convince people to give higher priority to AIDS prevention. We have seen time and again that policy-makers have been unwilling to commit significant human and financial resources to preventing AIDS until they are confronted with a lot of AIDS. So many places in the world, especially countries in Asia, are poised to experience a rapid rise in new infections that it is necessary to advocate for immediate action. If we can use economic tools and arguments to help get this message across, especially to make the point to policy-makers, who do not usually deal with health problems, all the better.

To whom do we need to address our economic advocacy messages? To the private sector, because when we have convinced them that a limited investment in prevention will avert future costs, we have seen that they have undertaken effective prevention activities with workers and their families; to the public sector, especially government ministries more familiar with economic rather than public health arguments (such as planning, finance, trade, commerce) or ministries that will have to deal with the epidemic’s impact (such as social welfare, health, and the military); and finally, to the international donor community to push AIDS higher on their agenda.

What studies are needed to be able to advocate more effectively? One approach has been to argue that society will bear a high cost if large-scale prevention efforts are delayed. For example, a Thai study argued that the total cost of AIDS by the year 2000 will be >$10 billion [2]. If half of those cases could be prevented by an investment in the hundreds of millions, then we can use the argument that AIDS prevention is an investment with economic return, in addition to humanitarian return—in other words, that it costs more not to prevent AIDS.

Estimating the Cost of AIDS

The most common approach typically estimates the cost of one human immunodeficiency virus (HIV) infection in two parts: the direct medical care costs and the indirect costs of lost production. The total cost per infection can then be multiplied by the expected number of infections to arrive at a projected cost to the national economy. Many studies have been done estimating these costs in both developing and developed countries [3-14]. Typically, these have shown high direct costs of care, as high as or higher than most other causes of fatal adult illness, which is understandable given the relatively long period of chronic disease preceding death; indirect costs have been estimated at many times the direct costs: 10, 15, or even 20 times higher, depending on the study.

But both direct and indirect costs have, as expected, varied with the wealth of the country. In a low-average-income country, such as Haiti, Tanzania, or Nepal, the average lifetime medical cost per AIDS patient is low, as is the average value of the person’s lost earnings; both are correspondingly higher in middle-income countries such as Brazil, Botswana, or Thailand and highest in high-income countries such as the United States, Sweden, and Japan. The direct cost for one infection has typically been estimated as between 1 and 2 times the per capita gross national product, which, translated into US dollars, is hundreds of dollars for low-income countries, thousands of dollars per infection for middle-income countries, and tens of thousands for high-income countries, with indirect costs correspondingly in the thousands, tens of thousands, and hundreds of thousands of dollars per person infected with HIV—two orders of magnitude difference between rich and poor.

The other approach to estimating the cost of HIV infections uses more elaborate macroeconomic models of a national economy and examines the effect on national economic growth of reducing the labor force because of deaths from AIDS. These models have been applied by Cuddington, Over, Kambou, Way, and others [15-18] to heavily affected countries in sub-Saharan Africa and have suggested that there will be significant, though not dramatic, decreases in economic growth under the assumptions used in the models.

McGraw-Hill has examined the projected effects of deaths due to AIDS using its global macroeconomic model and, in doing so, highlighted a point that may be very useful for advocacy [19]. High-income countries with a relatively small epidemic, such as Japan, are likely to experience the greatest economic impact, not from infections in the Japanese work force but rather from a fall in trade because of infections in other countries. This suggests that it may be in a country such as Japan’s economic self-interest to invest in HIV prevention in developing countries that are major trading partners.

However, we must be cautious about linking our advocacy arguments and even more cautious about formulating policy based on these crude estimates of macroeconomic impact.

In 1988 at the Global Impact of AIDS Conference in London, a participant made a very unpopular observation. He said that this talk of negative economic impact of AIDS was fine and well, but that he worked in New York City with persons who were injecting drug users and living with HIV and cautioned...
that if an economic analysis was done of the impact of deaths from AIDS among his clients, it might show economic benefit for New York City.

David Bloom [20] has pointed out that the per capita average income rose in Europe after the black death in the 1300s, which killed an estimated 25% of the population of Europe, and that it also rose in India following the 1918–1919 influenza epidemic. There are many reasons why AIDS is different from those epidemics. For example, influenza preferentially kills the elderly and chronically ill rather than society’s most productive. But Bloom also pointed out that though we have predicted important effects from AIDS on national economic growth, we have not yet been able to conclusively demonstrate such an impact even in the most heavily affected African countries. So, caution is appropriate, before we argue too strongly that impact on economic growth is the reason to invest in prevention.

But is this not ridiculous? Anybody who has visited Rakai in Uganda, Kagera in Tanzania, the Copperbelt in Zambia, or even northern Thailand knows that AIDS is having a devastating impact. How could anybody suggest otherwise? There is no attempt to deny the devastation in places with severe epidemics weakened by AIDS but rather to suggest that change in the national economic growth rate may not be the best way to measure it.

If we have learned anything from the last two decades, it is that national wealth may increase at the same time that the number of poor increases—if some people get richer while others get poorer. Perhaps because we don’t like to think about it, we have almost no information about how the epidemic may be improving the welfare of some nonaffected households. Consider, for example, that a job lost because someone falls ill is a job opportunity in the eyes of someone who is unemployed.

Breakdown of Vulnerable Structures

Many studies have observed that if AIDS affects a moderately well-off household, it may join the ranks of the poor; a poor household may be pushed to the frontier of survival. There is strong evidence that the epidemic is both exacerbating existing poverty and creating new poor [21, 22]. Thus, it may be that if we want to best capture the impact at the national level, we need to study the epidemic’s impact on the magnitude and severity of poverty, rather than on national economic growth.

Consider another possibility. Suppose that the most important economic impact of AIDS is not a result of its incremental effect in reducing the labor supply but rather the result of concentrated impact on vulnerable structures, causing them to break down.

If someone took a blowtorch and heated the railroad track as the train rolled from Tokyo to Yokohama, the heat would be absorbed and dissipated and nobody would notice. But if the same time was spent heating one place, the rail could be cut and the train derailed—what an economist might call a discontinuity. The train doesn’t gradually slow down. Instead, it runs along just fine until all of a sudden it ends up in the Bay.

Similarly, a family, community, or even nation may be able to adopt a number of coping mechanisms that help to absorb and thus conceal the impact of the epidemic until that household or community is no longer able to cope and breaks down. The vulnerability of a structure to breakdown obviously depends on how strong it was before.

A vulnerable household, as Barnett and Blaikie [22] and others have described, may be poor and have few working-age adults, minimal extended family or community support, and a rigid division of labor and skills by sex. A vulnerable community may be poor, marginally food-secure, and dependent on crops with high peak seasonal labor demand. A vulnerable country may be poor, land-scarce, and politically unstable.

Vulnerability is a function not only of how weak the structure is but also of how much the impact is concentrated. We are all familiar with extreme differences in HIV prevalence between countries, between communities within a country, and most strikingly, from household to household — where this particular virus, because it spreads between couples and from mother to child, often affects multiple members of the same household. We have seen AIDS break down households around the world, from the Bronx to Santo Domingo, from Milan to Ouagadougou and Chiang Mai. We have watched it wreck communities in places like northwest Tanzania and southern Uganda.

David Bloom remarked in August 1993 that in no country could he yet find clear evidence of a macroeconomic impact from AIDS. One possible exception came to mind, Rwanda. It was poor, land-scarce, and beset by decades of ethnic tension. To that AIDS added worsening poverty and thus increasing social inequity. But perhaps more important, Rwanda faced an HIV prevalence in the general population that was among the highest in the world; among military personnel it was almost certainly higher still. Nobody knows the ingredients of the glue that holds the thin veneer of peace on society, but our concern about our long-term future and that of our children must be one important element. HIV robbed many, many of the young men in the military of their dreams for a long-term future. While we will never understand the relative importance of all of the factors, surely HIV contributed in an important way to the breakdown of a country.

Resource Allocation

If we succeed in convincing policy-makers with our advocacy message and obtain the needed funds for HIV/AIDS prevention, then how useful are these economic cost estimates for helping local, national, and international policy-makers allocate funds for prevention?

If the impact of an HIV infection and therefore the benefit of preventing one is measured in direct and indirect cost as described above, then the economic benefit of preventing an
infection in (for example) Uganda would be in the thousands, in Thailand in the tens of thousands, and in the United States in the hundreds of thousands of dollars. All else being equal, that suggests that the greatest benefit from preventing one infection would be in the United States.

Consider a completely different approach, for example, using a hypothetical HIV hunger index to measure impact. On average, for every case of HIV infection, how many people who would have been able to meet their nutritional needs are now hungry? And how many that would have been hungry are now acutely malnourished? By use of such a hunger index, all else being equal, the greatest benefit from preventing one HIV infection would probably be in Uganda. This suggests that there are clear value implications in the choice of methodology that is used to measure impact. And it suggests that when we measure the impact of AIDS, we have an obligation to develop and use methods that capture not only changes in production but also changes in broader measures of welfare.

Impact Alleviation

Suppose that, instead of studying socioeconomic impact for advocacy, we have been asked a completely different kind of question by a ministry of social welfare: Should it focus on improving access to primary education? On developing support groups for caregivers? On protecting property rights of widows and orphaned children? Or on helping infected military personnel learn how to live positively with HIV? Estimates of average direct cost and indirect cost won’t be of much help. The primary impact of AIDS is to increase poverty [23]. That statement may be true, but it doesn’t help the ministry figure out who is becoming poor or help them figure out how to modify their poverty alleviation program.

For example, Shaeffer [24] has argued that AIDS has an important impact on the education sector, in part because the demand for education will decrease as children from affected households are less able to go to school. While this is certainly true, we know very little about the magnitude of this problem relative to other problems—even in the most heavily affected areas. Why is that? Partly because we know so little about the socioeconomic characteristics of the households affected by HIV. If a relatively well-off household in a developing country is affected, the effect on education may be minimal because the household can protect its investment in education at the expense of other consumption. In a poor affected household, there may also be no effect on education because there was no money for school fees even before AIDS.

The team doing a major household survey in the Kagera region of Tanzania reported preliminary data on the correlation between parental death and school enrollment rates of children. The striking finding was that parental death seemed to be a relatively minor determinant of whether a child was in school. For example, in the 7- to 10-year-old age group it was difficult to show an effect of adult death, but <40% of all children in that age group were in school regardless of orphan status [25].

A study from Zaire in a population with a much lower seroprevalence was unable to demonstrate significant differences in morbidity, mortality, or socioeconomic status between children whose mothers had died of AIDS, those whose mothers were living with HIV, and those whose mothers were not infected [26].

Neither of these studies suggests that a parental death is not a catastrophe for a child—that is incontestable—but they do suggest that there is likely to be a large variation in socioeconomic status across the children in a community and that the average difference between children who have and children who have not lost a parent to AIDS may be much smaller. Thus, we cannot assume that orphan status is the best way of identifying the children in a community most in need of material support. However, a caveat is also appropriate: If the hypothesis about the importance of collapse of social structures, in this case the household, is correct, then these studies may have missed some of the most affected children because they dropped out of the sample.

Research Priorities

Hypotheses repeated often enough in the literature and at conferences have a way of appearing to become facts. We now need to collect data to find out which of the hypothesized impacts are the most important, especially in countries where the epidemic is shifting from a rapid growth phase to a major endemic problem. Only in that way can we base alleviation policies on more solid ground than the conjectures of armchair economists.

Fortunately, such efforts have begun. Major quantitative studies designed to understand the impact on households have been completed by teams in Tanzania and Ivory Coast and should be analyzed within the year [27, 28]. Smaller qualitative studies on household coping mechanisms supported by the World Health Organization are underway in five countries. The Food and Agriculture Organization supported an important series of studies of the effect of AIDS on small-holder agriculture in Uganda, Tanzania, and Zambia, which demonstrated the usefulness of using available data to map the relative vulnerability of different farming systems to labor loss, in essence creating an early warning system.

A study being finalized in India has surveyed households in an attempt to map the most important determinants of vulnerability to the impact of an adult death [29]. A large-scale population-based household survey is planned for next year in Thailand that expects to collect data on HIV prevalence as well as socioeconomic data.

However, in countries poised to experience rapid growth in HIV prevalence (such as many of those in Asia) but that do not yet have major epidemics, let us not concentrate our economic research on predicting the scale of economic impact. The num-
bers will be disappointingly low for advocacy and premature for impact alleviation. Rather, let us concentrate on understanding how economic factors fuel the spread of HIV and on learning to spend our prevention dollars more wisely. The results of those studies not only will help to slow the epidemic but also will prove to be more effective tools for advocacy.

Regardless of the stage of the epidemic in a country, there is one step that needs to be taken, whether we wish to improve our understanding of how economic factors fuel the epidemic or of how they determine its impact. More socioeconomic data need to be collected and linked with the data on HIV prevalence. This far into this epidemic we are still guided far too much by conventional wisdom about the socioeconomic distribution of infection along socioeconomic lines.

**Impact on the Individual**

Why is it that whenever we talk about impact of AIDS, we jump right to survivors, households, or communities, just as this paper has done? The focus seems very different than for other serious or fatal diseases of young people, such as sickle cell anemia or Huntington’s chorea. For those diseases, the primary concern seems to be impact on the affected individual, not his or her household.

It is worrisome to think that it has happened because the primary use of “impact” has been as an advocacy tool, and consciously or subconsciously, people have decided that policy-makers are more likely to pay attention to the impact on “innocent” survivors than the impact on the “guilty” persons infected with HIV. If that is true, then it forces us to ask ourselves about how much our own thinking about the problem has been influenced by our approach to advocacy. Now that increasingly we are doing advocacy for alleviation of impact, our biased reporting of impact will result in inattention to the needs of the people affected most, those who are infected.

As economists, we have largely ignored this area. Yet, we have been ringing alarm bells for years about the increasing expenditures for medical care that can be expected with the epidemic. Medical care is part of what we can do to alleviate the impact on people living with HIV/AIDS, but only part. If we do not understand the most important aspects of the impact from the perspective of the infected person, how can economists pretend to be optimizing the expenditure of resources to minimize the impact?

Permit me a personal perspective. I am much more afraid of dying than I am of being dead. Thus it makes a big difference to me what I die from and what the circumstances of my death are. I want the illness that leads to my death to be short. I am not especially worried about the number of days from work I will miss (indeed this may be the only benefit), but I am very concerned about pain, nausea, chronic diarrhea, shortness of breath, and incontinence. I’d want to avoid them all, and if I lived where it was a 20-minute walk to clean water or where I couldn’t cook unless I went out and collected firewood, I would be even more concerned about avoiding those problems.

If I tell people that I’m dying, I want them to worry about how I’m doing, not about who I’ve been sleeping with. I want them to help me, not avoid me; appreciate me, not fire me. To avoid all of these problems, I would be willing to pay an awful lot of money. I haven’t mentioned postponing death—I assume that we would all be willing to do that. I’m talking about willingness to pay to avoid all of the disease-related problems mentioned above. How is this personal perspective related to economics? Economics is the science of making choices; of making choices that maximize benefit. Sometimes the most difficult part is figuring out how to define benefit. Most economists are defining benefit of an intervention to a person living with HIV/AIDS in terms of years of life gained and months of disability averted. And those measures don’t begin to capture all of the things I would be willing to pay to avoid.

This poses a serious problem for economic analysis. If interventions are evaluated only on the basis of disability reduced and death postponed, then many developing countries with severely constrained resources could conclude that they are relatively impotent at alleviating the impact on a person living with HIV/AIDS because reducing this impact requires expensive drugs and diagnostics. This would be an unfortunate conclusion, because interventions to reduce many of the types of impacts mentioned above are within the means of all communities.

Pain control is not expensive. Discrimination, stigmatization, and isolation cost money to maintain. Support groups for people living with HIV/AIDS and for their caregivers are not expensive. Helping people with the activities of daily living can be done inexpensively because the cost of these types of interventions is largely determined by the cost of labor, and that is correspondingly lower in low-income countries.

If we use a resource allocation model that values the benefit of treating cryptococcal meningitis but not that of pain relief or a clean bed, then we will end up purchasing amphotericin at the expense of morphine and sheets. And if that does not reflect the priorities of the people living with HIV/AIDS in that community, then we have not been helpful.

AIDS has once again forced us, physicians and economists alike, to recognize our weaknesses. It has taught physicians that they cannot assume that they know what is best for their patients, and it has taught economists that they cannot assume that they know what patients want. We won’t know until we ask.

**Conclusions**

Abrupt changes or discontinuities in social structures as a result of the impact of HIV may be more important determinants of the magnitude of the impact than the incremental changes we are accustomed to measuring. At the individual level, this is certainly true: Disease is often abrupt and death...
is the ultimate discontinuity. The larger the structure, as one goes from individual to household to community to economic sector to a nation-state, the greater the capacity to distribute and thus absorb the impact. We must develop a better understanding of what makes structures at all levels vulnerable to collapse, so that we can intervene before breakdown occurs and catastrophe ensues.

AIDS will push affected households down the poverty scale, pushing some into poverty and aggravating the poverty of others. Thus, we must address household impact in the context of poverty alleviation more generally in that community, targeting the neediest, not necessarily those who joined the ranks of the poor most recently.

At the same time, we can recognize that the particular characteristics of this epidemic offer opportunities for designing and targeting interventions to households in new ways. For example, households often have years of warning before children become orphans. If coping mechanisms can be strengthened during that time, the household is more likely to be preserved. Similarly, because we have the opportunity to identify those at risk of becoming poor, we may be able to develop poverty prevention interventions, such as facilitating access to credit.

To design comprehensive care approaches for infected persons that are appropriate for different settings with different cultural and resource constraints, we must learn more about how people living with HIV/AIDS in those settings perceive the impact, so that we can prioritize interventions by using yardsticks that measure what they perceive to be their most important needs.

References