Economics and HIV

The sickness of economics

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For May and Gerry – much missed.

Acknowledgements

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Failed opportunity?

Aim of this book

This is a book about economics and HIV/AIDS. It sets out the various ways that the discipline of economics, both in its mainstream and heterodox versions, has engaged with this terrible disease, and considers both the economics debates over the acquisition of HIV and the impact of AIDS. It is, of course, designed for economists, but not exclusively so. The orientation of the book is on the evidence from sub-Saharan Africa, so it is hoped that development academics and students interested in African countries will also find it useful. The book has hopefully been written in such a way that it will be accessible to those from a range of disciplines and interests.

For me, this book was inevitable – perhaps not writing itself, but emerging almost naturally. Beginning my career as an economist in the late 1980s, I was one of the many in southern Africa who watched with disbelief as the tidal wave of HIV rolled through us. In the 1980s, in Lesotho, HIV was colloquially termed 'the disease that swims in foreign oceans', a reference to the fact that then it seemed to be a problem for 'others'; a problem only for those from other parts of Africa. But of course, HIV had already begun to make its invisible arrival, and only a few years later this would be apparent to all.

Given the scale of HIV incidence, it seemed impossible to maintain any kind of disciplinary boundary between health and economics when analysing the development prospects of high-prevalence countries. Economists (of all kinds) puzzled to understand how HIV/AIDS would affect African countries. However, reading economics papers on HIV/AIDS was deeply frustrating – our approaches as economists were extraordinarily uneven and failed to reflect on the range of approaches both within economics and in other disciplines. Contributions were often shorn of any history of the discipline in this area – no mention was made of how disease in general had come to be approached in this manner by economics, and what the range of approaches were. The work of economists on HIV/AIDS was in desperate need of a critical review that sets it in relation to our perspectives on disease, and those of other disciplines. This book is my attempt to produce such a review – not as a purely academic exercise, but also in order to help pave the way for stronger and more effective approaches within economics to HIV/AIDS.

Writing a book about HIV/AIDS, however, presents problems. As we shall see, uncertainties remain about some aspects of the virus, while at the same time new information is gained monthly. Perhaps one of the biggest debates is over the cause of the highly uneven prevalence of HIV worldwide. Specifically, the question most often asked is why HIV prevalence rates are so high in many countries of Africa, but not in other parts of the world, even in countries of Asia which may be thought to have similar economic or social contexts. This is a heated debate that has been played out most prominently in the pages of the *Lancet* and other top journals publishing AIDS research. Perhaps the best current example of this – at the time of writing this book – is the debate about the role of concurrency in leading to high HIV prevalence rates in African countries. These issues will be discussed in more detail below and in Chapter 3. However, it is suffice to say that concurrency, or overlapping sexual partnerships,[1] has been seen by many working in this field as the strongest explanation for Africa's high HIV prevalence rates. Always under debate, however, the concurrency theory has been held up for renewed critical inspection as recent empirical research has found rather more limited support.[2]

Many of these debates will be touched on in this book. And indeed, it is impossible for them not to be – as the debates over the causes of the high HIV prevalence in Africa draw on biomedical understandings of the virus, discussions of health systems, social practices and sexual norms. However, it is not the intention of this book to resolve these debates, but simply to explain them and to suggest particular ways of trying to reconcile various perspectives. At the same time as negotiating divisions among the academic establishment, this book also has to deal with the fact that new evidence about HIV and AIDS is emerging almost constantly. For example, at the time of writing, evidence has emerged about our understanding of HIV transmission in the context of antiretroviral (ARV) drug use.[3]

So knowledge about HIV/AIDS is not complete, uncontested or even stable. This presents challenges for those who want to write about it. Social science writing on HIV/AIDS has often been 'unsatisfactory' (Marks 2007) due to its reliance on limited information, dated evidence and poor theorization. Picking up a theme that has also been elaborated by others, Marks (2007) highlights the way that such imperfect evidence and speculation has become 'fact' through constant repetition and citation.

Writing a book about HIV/AIDS that will have any value or longevity is difficult. How to deal with that? One response to the issue of evolving knowledge is to take the realistic approach – to recognize that this book can only ever present its best 'snapshot' of what we know at the present time. As such, it is partly enfolded in empirical evidence that has been collected at specific points in time – it will quickly be a reservoir of the kind of dated evidence that Marks refers to above. However, at the same time, I aim for something of longer-lasting value – insights that will last beyond the next round of biomedical or social science discovery. The intention of this book is to go beyond the merely descriptive, and to connect the debates within economics about HIV/AIDS to larger discussions both about economics and health, and about economic theory generally.

There are many areas that this book does not cover. It contains the briefest section on the nature of the virus, but those wanting to know more about the bio-medical nature of HIV and AIDS are advised to look at updates on the WHO and UNAIDS websites (www.who.org and www.unaids.org, respectively), and to look at academic articles in the *Lancet* or *AIDS* journals. At the same time, this book is not an account of the way that individuals experience HIV or AIDS. There are many excellent ethnographic accounts of this terrible illness. Indeed for much of this book, the language used might conceal the fact that actual people live (and die) with the suffering brought by AIDS. The language of main-stream economics, with which most of the book deals, is depersonalized – and of course, this is a deliberate choice, in order to establish a 'scientific' analytical approach with representative individuals, making rational choices to optimizing behaviour in anonymous markets. There has always been a debate about this form of representation – in a discussion about the economics of HIV/AIDS, it is a language that may become offensive to readers. I wish to apologize for this, but will also later explain, if not defend, it. For me, however, the deficiencies of the mainstream economics approach range far wider than its imperfect expres-sion of humanity.

Overview of the findings and structure of this book

Economics has largely failed to provide useful insights on the HIV/AIDS pan-demic, and this book sets out the dimensions of this failure. The inability of a dominant branch of social science to assist in understanding an illness with significant social, economic and emotional effects is a serious failing in its own right. Moreover, the inadequacy in its explanatory power also highlights an important weakness in 'mainstream' economic theory, the economic approach used by most governments and institutions.

Part I of the book sets out the role that economic analysis has had, and why it can be judged to have failed. If mainstream economics is accused of imperialism across the social sciences, as it has been by many (see, for example, Fine 2002), this would make it the emperor of the social sciences. How strange then that economics has been so inadequate in its analysis of one of the most significant health crises that has affected the world.

This book explains how economics has been applied to a terrible pandemic, using a range of examples drawn from the region most affected, sub-Saharan Africa. Part I shows that microeconomic approaches have found fertile ground in a public health approach that 'blames' individuals' choices for HIV trans-mission. Despite their attractiveness, however, these approaches fail to explain contemporary patterns of HIV prevalence, illustrating the importance of factors that are excluded from the standard microeconomic approach. It is well known that the methodological approaches of economics have spread ever more widely, seemingly in response to the demand for useful frameworks to deal with a range of problems that traditionally have been the preserve of other disciplines.

The first part of the book sets out the role that economic analysis has had in the analysis of the spread of HIV. It provides an overview of the way that different approaches have risen or fallen out of favour, and importantly explains why economic approaches – despite their failings – are important to understand, given their policy influence. It also gives the reader an overview of key characteristics of the HIV/AIDS pandemic (and provides references for further reading), in order to provide the context for subsequent chapters.

Part II of the book looks at our problems in understanding the economic impact of AIDS, and explains why economists cannot agree whether epidemic disease is a good or bad thing for economic development. There have been vastly different readings of the historical effects of widespread disease on economic growth and poverty reduction. These arguments have their parallel in the analysis of the contemporary period. We shall see that the debates over the impact of AIDS are not only about what models to use to capture impacts. There is also a more fundamental debate – what are the channels by which disease affects productivity and incomes, and what are our theoretical assumptions? When looking at the very modest impacts on economic growth (and even positive impacts on GDP per capita) found by impact studies, some economists are surprised and others are unsurprised. However, it is argued in Part II that both viewpoints have too simplistic a view of the impact of disease. The context in which AIDS is experienced, in terms of both the economic and social relations of production, is crucial in explaining how economic growth and poverty will be affected.

In both sections of the book, the potential for alternative approaches is shown, and the book ends by arguing that a political economy approach can bring meaningful insights to our understanding of the spread and impact of HIV/AIDS. The issues raised in both sections of the book also illustrate that we need to improve data and evidence on both HIV incidence and AIDS impact. The need for more and better data is not, as is sometimes thought, to serve a dry and dusty academic debate – as the book shows, in most settings, policy-makers and practitioners, as well as academics, have huge knowledge gaps about this disease. And these knowledge gaps are important in the context of significant differences both within and between countries in the ravages of HIV.

Some very basic facts about HIV/AIDS for economists

This subsection attempts to set out some very basic facts about HIV/AIDS which might be helpful as readers navigate the book. Understanding the characteristics of HIV and of AIDS is important in understanding how the disease interacts with economic and social factors in any setting. One of the criticisms that we will meet below is that many economic approaches to HIV/AIDS fail to see it as a distinct disease with particular pathways of transmission and patterns of illness. It becomes part of an undefined concept of 'health', and its particular characteristics are not distinguished.

HIV is transmitted by sexual contact, through blood and from mother to child. The Human Immunodeficiency Virus (HIV) mutates rapidly, like all viruses, and

so exists in many different strains which have been classified into types, groups and subtypes (or clades). The very act of classification is, however, an area of debate, as new discoveries alter some scientists' views. It is though clearly agreed that there are two types of HIV: HIV-1 and HIV-2. HIV-1 is by far the predominant form, with the HIV-2 type usually only found in West Africa. However, it seems that HIV-2 is less easily transmitted, and this has been seen as the reason for lower rates of prevalence in West Africa (Iliffe 2006). The strains of HIV-1 can be classified into several groups, with the most important being Group M. Within Group M, there are several genetically distinct clades of HIV-1 (with at least nine identified by researchers); these are clades A, B, C, D, F, G, H, J and K.

The main clade in Western Europe, the Americas, Australia and Japan is clade B – and this is the clade that most research on a vaccine for HIV, to date, has focused (WHO 2008). However, clade C is found most commonly in Southern and East Africa, India and Nepal. As such, clade C is the most common HIV clade in the world, and is dominant in areas of the highest HIV prevalence. After that clade A is also perhaps the next most commonly found clade.

This categorization of HIV becomes relevant because there is some debate about whether certain clades are more easily transmitted than others, and if some lead to rapid illness and mortality. The relative 'virulence' of the dominant clade in Southern Africa has been one of the explanations for the high prevalence rates there – so, for example, Marks (2007: 863) argues that:

> The specific clade, or subtype, of HIV1 that occurs in southern and eastern Africa, is of considerably greater virulence and infectivity than the clades elsewhere. The C clade predominates in southern and eastern Africa, where HIV/AIDS has proven most devastating.

However, the scientific evidence is not always clear and the geographic dispersion of the virus is becoming more complex. Interestingly, at the time of writing this book, the evidence seemed to substantiate a concern that clade D is more virulent – in the sense of leading to earlier morbidity and mortality (see, for example, Easterbrook *et al.* 2010). Clade D exists most commonly in parts of Central and East Africa, such as Uganda and Kenya.

At the same time, an early study of sex-workers in Senegal found that women living with clade C, D or G were more likely to develop AIDS within five years of infection than those infected with clade A (Avert n.d.). Studies of mother-to-child transmission also seem to find a difference in transmission, but the evidence is not clear and studies find contradictory results (Avert n.d.). This is clearly an area for more research, and readers are encouraged to update themselves with the latest findings by consulting articles in the *Lancet* or other leading AIDS journals.

While the rate of transmission of HIV may be affected by the clade involved, it is important to recognize that transmission is not simply an artefact of viral type, but is also affected by a range of other social and policy factors. There has

been some evidence that the presence of other sexually transmitted infections both increases the likelihood of contracting HIV, and of transmitting it (Stillwaggon 2006; see also CDC 1998). There are also arguments that poor nutrition, parasitic disease and malaria increase the chances of contracting HIV, and also the onset of AIDS (Stillwaggon 2006). The role of other health conditions in increasing the transmission and virulence of HIV is an important area of future study.

There is evidence that male circumcision reduces HIV transmission from women to men during sex, because circumcision removes the foreskin which is particularly susceptible to HIV infections (WHO 2012b). Voluntary medical circumcision may reduce transmission to men by 60 per cent. At the time of writing, there was also emerging evidence that taking ARVs reduces HIV transmission from an HIV positive person to their HIV negative partner (WHO 2012a). And of course, certain drug regimes have proved highly effective in reducing mother-to-child transmission, but are not fully administered (UNAIDS 2010). Thus, public health policy on the treatment of sexually transmitted infections, on circumcision, nutrition, drug access for mother-to-child transmission and ARVs generally will affect both adult and child transmission rates in particular settings.

Perhaps the clearest area where we see differential transmission of HIV is in terms of gender. An estimated 33.3 million people are living with HIV globally, and just over half are women and girls (UNAIDS 2010). However, this ratio is higher in sub-Saharan Africa, and UNAIDS (2010) estimates that across all African countries young women aged 15–24 years old are as much as eight times more likely than men to be HIV positive. In other regions, a far smaller percentage of HIV sufferers are women. This difference reflects the different routes of HIV transmission, specifically the transmission of the disease via heterosexual intercourse in Africa (of which more below).

It has been argued by many that the dominance of women in the prevalence data in African countries reflects women's greater vulnerability to the HIV infection (Quinn and Overbaugh 2005). This is a vulnerability that is seen as being created by both social and biological factors. It is frequently suggested that women are twice as likely to contract HIV through unprotected heterosexual intercourse as men. However, even this seemingly simple biological fact has an important social dimension to it. Young women may have a particularly greater vulnerability to HIV because the lining of the neck of the womb is not fully developed (UNAIDS/UNFPA/UNIFEM 2004), and so the overall vulnerability of female populations is affected by the age of first intercourse for girls. Added to this are other social factors that we shall discuss at some length later in Part I. More specifically here, it is relevant that – in many countries – women are restricted in their ability to negotiate condom use, and some women may be subjected to non-consensual sex (ibid. 2004). So it is clear that transmission rates in various settings will be partly determined by gender relations concerning sexual intercourse.

In her book *The Wisdom of Whores*, Elizabeth Pisani (2008) reminds us that HIV is primarily transmitted by sex – so if we want to understand the spread of

HIV, we have to understand more about sex. To understand transmission routes, epidemiologists use information on patients, survey evidence and modelling. It remains generally true that sex is a key transmission route, although there is still a bitter debate about the scale of medical transmission of HIV in many African or low-income settings (see Gisselquist 2004, for example). When we focus on the transmission of HIV, it has long been assumed that there are stark differences in the patterns of transmission by region – with heterosexual transmission being dominant in sub-Saharan Africa, while homosexual and intravenous drug use is more important in other regions. However, UNAIDS (2010) reminds us that in the high prevalence countries of sub-Saharan Africa, there is increasing evidence that sex between men and the use of contaminated drug-injecting equipment are significant factors in the HIV epidemics of several countries.

The official data for Africa, however, clearly suggests that HIV is primarily transmitted through heterosexual sex. Along with many other authors, Stillwaggon (2008) challenges common notions of an exceptional African sexuality by reminding readers that studies find that the average number of lifetime partners is far greater in North America and Europe than in African countries. At the same time, although the sexual activity is a key transmission route, the age of sexual debut is far lower in the US and UK than in the African countries for which data exists (Stillwaggon 2008: 73).

Many analysts, such as Wellings *et al.* (2006: 1714) and Epstein (2007: 49–85), suggest that a prime cause of the high prevalence rates in many African countries is the relatively widespread nature of concurrent (i.e. overlapping) sexual relationships, rather than the absolute number of sexual partners. As stated at the start of this chapter, there remains a debate about the role of concurrency, with proponents facing the problem that the data do not always generate a supportive picture (UNAIDS 2009). So to be clear, it is not so much the number of sexual partners in any time period that matters, but whether such partnerships occur at the same time and have a long-term character. Such long-run, overlapping partnerships appear to promote the spread of HIV in two interconnected ways. First, they facilitate sexual contact with others soon after an individual has contracted the HIV virus from another person, and hence at a time when the virus is at its most infective. At the same time, and importantly, condom use is far less common among long-term partners than among casual partners, and so long-term concurrent partnerships will be more risky than high numbers of serial partnerships.

While concurrency seems a favoured, if still controversial, reason for high prevalence rates in some African countries, there has been a related argument about high rates of transactional sex. Transactional sex relationships are sexual relationships where the giving of gifts or services is an important factor. Most authors distinguish them from sex work per se, where the income from sex provides the dominant form of income for an individual. In contrast, transactional sex provides only a portion of the income of the person providing the sex, and those offering sex may feel affection or have other obligations towards their partners.

Transactional sexual relationships are thought to increase HIV risk because they are often associated with relationships where there are multiple partners, or where the relationship is between older men and younger women. UNAIDS/ UNFPA/UNIFEM (2004) suggest that intergenerational and transactional sex are frequently intertwined, and that the older age of the male partners means that they are more likely to be HIV positive. The dependencies built into these relationships limit women's abilities to protect themselves from HIV infection, especially when the perception of younger women as 'pure' encourages men to avoid using condoms (Poku 2001).[4]

Thus, rather than high rates of sexual activity per se, many within epidemiology suggest that sexual transmission in African countries may be driven by a combination of concurrency, transactional sex and intergenerational sex. There is strong debate about each aspect of this overall argument, with each side bringing into play empirical evidence (or the lack of such evidence). As noted above, there are many who doubt the concurrency argument, while others are critical of the transactional sex argument – pointing to the existence of transactional sex in other settings with low rates of HIV prevalence. Perhaps the key aspect to bring away is that the major transmission in African countries is thought to involve widespread and generalized sexual relations, rather than risks within specialized groups (such as sex-workers, or men who have sex with men). And of course, each one of these transmission routes is shrouded in a particular set of moralistic overtones. So while there may have been a move away from the broad 'pathologizing discourses' that haunted the early response to AIDS in Africa, with their undertone of a black sexuality that was uncontrolled or unbridled (Marais 2005: 15), there remains – in much of the wider discourse – a view of sexuality that it is irrational or invites affliction.

In this discussion of transmission, however, it should be noted that we should be careful about assuming similar pictures across African countries. Wilson and Challa (2009: 14) show evidence to suggest distinct transmission patterns between three African cities which seem to illustrate important differences in transmission between West, East and Southern Africa. In Accra, Ghana, prevalence rates are approximately 2 per cent and most transmission is attributable to sex work, making programmes to protect sex-workers and their sexual partners a priority. In Nairobi, Kenya, the epidemic appears to have a more complex character, with transmission among both HIV-vulnerable groups (such as sex-workers and their clients) and the general population. As a result, interventions must be designed for both of these groups. In Zambia, prevalence rates are high and the evidence suggests that most transmission is unrelated to sex work, occurring in the general population rather than specific risk groups. These different patterns of transmission have important implications for policy to reduce HIV risk.

The definitions of what constitutes AIDS (Acquired Immune Deficiency Syndrome) are somewhat less contentious than the definitions of HIV types and subtypes, although subject to minor differences from country to country. The US definition (CDC 1992) defines someone as having AIDS if they have one of 26

specific diseases, but no known cause of immune deficiency other than HIV; or if they have a CD4+ cell count (a specific type of white blood cell) below 200 cells per cubic millimetre of blood, plus a positive HIV test. The criteria for diagnosing AIDS attempts to capture individuals with a specific set of illnesses, so it is important to recognize that there may be individuals with compromised immune systems suffering illness as a result of HIV who are not diagnosed yet as having AIDS.

There has been limited evidence about the impact of HIV and AIDS on morbidity and mortality in various settings. There is some uncertainty surrounding the duration of progression from HIV infection to death for different populations throughout the world (Sender *et al.* 2005). The 'rule of thumb' that has been used in much work on African countries, is that – without ARVs – illness and death occur approximately ten years after HIV acquisition. As we see in Part II, this assumption may not always be borne out by the evidence (ibid. 2005: 9). There is a need for greater evidence on the trajectory of AIDS in various African countries. It is obvious that the kinds of HIV/AIDS interventions provided by national health departments will also affect the rates of illness and mortality – and so ARV access will have a central effect. However, there is also evidence that the speed at which HIV-positive people begin to acquire illness is affected by poor nutrition and other ill health (Stillwaggon 2006, 2008). So once again, social, economic and policy factors will play a role in determining how and when HIV becomes AIDS, and how AIDS will impact the health of affected individuals.

Data on the scale of HIV epidemics

In the 1990s and 2000s, we thought that we had an African pandemic and we feared that this would be worldwide. By 2010, we knew that there was no global pandemic, but several different epidemics. Africa is the only region in which there are countries with generalized HIV epidemics – traditionally defined as situations where prevalence in the general population is more than 1 per cent (Wilson and Challa 2009). However, within Africa the trends and levels of HIV prevalence among adults were vastly different from country to country. Wilson and Challa (2009) characterize Africa's HIV epidemic as having several distinct clusters. Southern Africa is characterized by highly generalized epidemics, with HIV prevalence at that stage exceeding 15 per cent. HIV prevalence in East Africa was far lower and in many countries the trend was declining. Prevalence in West Africa has been far lower than in East Africa again, with stable or declining rates. As such, we can agree with UNAIDS (2010) that there is no African pandemic, but a series of individual epidemics with different starting points, levels and trends.

This discussion of prevalence begs the question of where we get data on HIV. UNAIDS publishes the official and internationally comparable data. Prevalence is calculated as a percentage of the adult population, 15–49 years of age. UNAIDS provides annually updated estimates of adult prevalence, using data

collected from sentinel populations. Typically, in African countries there are data collected from a sample of antenatal clinics. This has led to two kinds of criticism. First, that the sample of antenatal clinics is unrepresentative in various ways (with early samples being dominated by urban clinics, or those in areas where policy-makers were worried about particularly high rates of HIV), and second, that UNAIDS used a flawed methodology to extrapolate the data for pregnant women to the rest of the population (Bennell 2003).

The problems with the UNAIDS data were thrown into sharp relief by the divergent results of population-based surveys, which are household samples designed to be nationally representative. As Wilson and Challa (2009) report, 19 countries have conducted national population-based household HIV surveys since 2003, and in all but one of these, population-based estimates were lower than estimates based on antenatal data. Population-based estimates were just 20–50 per cent of antenatal estimates in parts of East Africa (notably Ethiopia and Rwanda) and much of West Africa (including Burkina Faso, Ghana and Sierra Leone). The challenge presented by these population-based data sets has forced UNAIDS to reduce its estimates in many countries, as well as to provide confidence intervals for its prevalence estimates. However, despite concerns about the methodology of UNAIDS' estimates, they remain the only regular source of data on HIV prevalence (given that population-based surveys are carried out irregularly) and so our only source of data on HIV trends.

A further problem is that prevalence data is data on the 'stock' of people living with HIV in any one setting. However, for much of our policy discussion, we might want to know about HIV incidence, which is a measure of new HIV infections in a given period, usually the previous year. Clearly, understanding incidence of HIV is the key to understanding the dynamics of the disease, and its size and trend should be crucial in determining policy response. The gold standard for measuring incidence is a prospective cohort study that measures the occurrence of new infections over time in a clearly defined population. However, such studies are extremely rare, due to their difficulty and expense, as well as being prone to biases (Kim *et al.* 2011).

Estimates of HIV incidence are usually produced through modelling, using a tool called the Estimation and Projection Package/Spectrum method, which estimates HIV incidence trends from HIV prevalence over time, combined with assumptions about the average survival of people living with HIV and the changing level of antiretroviral therapy (UNAIDS 2010). This method has been broadly validated through comparison with cohort measures of incidence, and has been applied to several settings where two such surveys exist. Of course, this can be problematic if there is concern about the prevalence data and where epidemics appear to have multiple and complex transmission patterns.

New laboratory methods are being trialled to estimate recently acquired HIV infection in samples of HIV positive specimens. These are based on the principle that antibody response to HIV infection matures over time and that immunological biomarkers of HIV disease progression can be used to distinguish recent from non-recent HIV infection (Kim *et al.* 2011). In a detailed comparison of the