ADULT MORTALITY IN THE ERA OF
HIV/AIDS: SUB-SAHARAN AFRICA *

Pierre Ngom ** and Samuel Clark ***

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INTRODUCTION

The strong age-specific impact of HIV on mortality is reshaping the population structure of African countries with substantial epidemics. The survival of adults in the worst effected countries is substantially reduced which will eventually depopulate certain tiers of the age pyramid, reducing the number of adults available to reproduce, and this together with the impact of HIV on fertility itself, will substantially alter the age distribution of severely impacted African populations for many decades to come.

This paper investigates the impact of the pandemic on adult mortality at the national level and examines the relationship between total adult mortality, HIV-related adult mortality and the prevalence of HIV among adults. The impact of HIV on the age-pattern of adult mortality is described, and data on existing age-patterns of adult death and the number of years of life expectancy lost due to HIV are discussed.

B. DATA

The data used in this work come from United Nations and World Health Organization sources. Data describing the overall number of adult deaths, HIV deaths and percent of adults infected with HIV (prevalence) come from the UNAIDS "Barcelona" Report 2002 (UNAIDS, 2002b) and refer to the calendar year 2001. Data describing the age-pattern of adult mortality come from the UN's World Population Prospects 2002 Revision (United Nations Department of International Economic and Social Affairs, 2003b) and refer to the calendar period 2000-2005. The Population Prospects contains projected figures based on empirical data collected largely in the 1990s, and for this reason the projections through the period 2000-2005 should roughly match the empirical figures for that same period. Finally, data describing the years of life expectancy lost as a result of HIV come from the UN's HIV/AIDS Population Impact and Policies 2001 (or AIDS Wall Chart) (United Nations Department of International Economic and Social Affairs, 2003a). Although most of the figures presented in the AIDS Wall Chart refer to the calendar year 1999, the life expectancy figures describe the period 2000-2005 and are therefore completely temporally compatible with the data describing HIV prevalence and number of adult HIV deaths from the Barcelona Report and the age-patterns of adult mortality from the World Population Prospects. All three data sources pertain to the same period of time 2000-2005 so the time referent for the work presented here is 2000-2005.

C. ANALYSIS AND RESULTS

1. *Adult Mortality Levels*

During the era preceding the HIV/AIDS epidemic, plausible levels of male adult mortality, as measured by the probability of dying between the 15th and 60th birthdays, $_{45}q_{15}$, ranged typically between 200/1000 and 500/1000 (Lopez et al., 1999). In other terms, under the pre-HIV/AIDS adult mortality levels, not more than half of survivors to the age of 15 died before their 60th birthday. Currently, such an indicator is out of these ranges in several sub-Saharan African countries especially in those with high HIV prevalence rates (Ngom and Ezeh, 2003). In Southern Africa where the HIV/AIDS epidemic is advanced, male adult mortality levels ranged from 57 percent in South Africa to 72 percent in Zambia. In all countries of this region, except South Africa, less than 40 percent of survivors to age 15 would not celebrate their 60th birthday under current adult mortality.

Generally, male adult mortality worsens as HIV prevalence increases. Ignoring some atypical observations, most values of $_{45}q_{15}$ are below 40 percent for low HIV prevalence countries (i.e. below 5%) most of which are in West and Central Africa, except Somalia and Eritrea. It is noteworthy that the majority of low HIV prevalence countries with abnormally high adult mortality levels are those with a recent history of civil war, i.e. Somalia (60%), the Democratic Republic of Congo (57%), Eritrea (49%), Chad (45%), and Guinea Bissau (42%). From levels below 40 percent in countries with HIV prevalence rates below 5 percent, $_{45}q_{15}$ reaches values above 55 percent in 8 out of the 12 countries with HIV prevalence rates between 5 and 10 percent, and increases above 60 percent in 9 out of the 12 countries where the HIV prevalence rate is above 10 percent (Table 1.1).

It is apparent, therefore, that differentials in contemporary male adult mortality levels are in part explained by the HIV/AIDS epidemic. For instance a simple log-linear model between national HIV prevalence rate and $_{45}q_{15}$ yield explains up to 60 percent of the variations observed between countries (Table 1.1). Such a relationship, when applied to countries where WHO data were not available, yields plausible values for national HIV prevalence rates; 12 percent in Djibouti, 1-3 percent in Guinea, Liberia and Niger, and less than 1 percent in Comoros, Gabon and Mauritania.

Female adult mortality levels follow the same patterns as those depicted above for males. There are, however, consistent gender differentials in adult mortality, almost always in favor of females, as expected. A striking pattern revealed by the data presented in Table 1.1 is the steep decrease in such differentials as HIV prevalence increases.

2. *AIDS-Related Adult Deaths*

Although it is certain that there are many, it is difficult to know the exact number AIDS-related adult deaths in Africa. This results largely from the widespread lack of complete and accurate vital registration systems and the fact that people infected with HIV die of many different immediate causes that are often recorded as the primary cause of death, even though HIV is the primary contributing cause. As a consequence, all figures describing the number of AIDS-related deaths in Africa are estimates of some kind. One of the most complete and up to date sources of estimates of this type is the UNAIDS Barcelona Report (UNAIDS, 2002a).

Table 2.1 displays the total number of HIV deaths, total adult population and crude HIV mortality rate for adults for the 35 countries in Africa with HIV prevalence among adults 15-49 (both sexes) of one percent or greater. The countries are listed in decreasing order of HIV prevalence, and grouped into five groups of seven countries each labeled "high", "high-medium", "medium", "low-medium" and "low" prevalence. Botswana clearly leads in terms of prevalence with 38.8 percent of adults 15-49 infected, but because of its very small population, accounts for few HIV deaths. South Africa suffers the most adult HIV deaths with at 350,000 and is also a member of the high prevalence group with 20.1 percent of adults infected. All five Southern African countries are in the high prevalence group, joined by two countries that are categorized as "Eastern" by the UN, but which are in fact close neighbors of the Southern African countries – Zimbabwe and Zambia. The average adult infection rate of this high prevalence group is 28.7 percent.

Table 2.2 displays the total HIV deaths, total population, crude HIV mortality rate and average HIV prevalence for adults 15-49 by region and prevalence group for the same 35 African countries with adult HIV prevalence of one percent or greater. Grouping by region, Southern Africa clearly has the greatest proportion of the adult population infected, but due to its relatively small total population compared to the other regions, has only about half the number of adult HIV deaths as Eastern Africa. The average prevalences and crude HIV mortality rates are: Southern Africa 29.2 percent and 15.41 per thousand; Eastern Africa 11.5 percent and 8.06 per thousand; Middle Africa 7.0 percent and 4.26 per thousand;

Western Africa 4.8 percent and 3.21 per thousand; Northern Africa 2.6 percent and 1.10 per thousand. By prevalence group in descending order the average prevalences and crude HIV mortality rates are: 28.7 percent and 17.55 per thousand, 12.3 percent and 8.65 per thousand, 7.0 percent and 5.27 per thousand, 4.5 percent and 3.25 per thousand, and 2.2 percent and 1.33 per thousand.

<center>3. <i>Age-Patterns of Adult Mortality</i></center>

a. <i>The Age-Pattern of Mortality</i>

An individual's probability of dying is primarily a function of sex, age, health, genetic endowment, and the environment, all of which determine the risk of falling victim to illness or accident. These factors work together and are influenced by a complex and ever changing set of social and historical determinants (<i>INDEPTH</i>, 2002a) The "age-pattern" of mortality describes the relative probability of dying at different ages and is influenced by all of these factors. In particular, the age-pattern of mortality strongly reflects a combination of a simple underlying aging effect and the impact of infectious and chronic diseases, and consequently the age-pattern of mortality is a good indicator of the underlying epidemiological profile of a population. Because the confluence of factors contributing to the risk of dying is so complex, there are no general theoretical models to predict the age-specific probability of dying, and as a result all practically useful age-patterns of mortality are empirical.

b. <i>The Impact of HIV on the Age-Pattern of Mortality</i>

The age-pattern of mortality is a population-level indicator resulting from the aggregated experience of many individuals. The impact of HIV on an individual's probability of dying is complex and depends on many factors including sex, mode of infection, number of infections, age at infection(s), immune competence, overall health, and treatment(s), among many. The natural history of an HIV infection in an adult is reasonably well characterized (Bajaria et al., 2002), but the population-level sex-age-specific mortality rate associated with HIV-related deaths is a very complex cumulation of many individuals' disease progression. The number and sex-age composition of the infected sub-population is in turn strongly influenced by population-specific behavioral factors such as sexual networking preferences and the prevalence of intravenous drug use and homosexual sex (although neither of the last two are of significant importance in sub-Saharan Africa). As an epidemic ages the sex-age composition of the infected and uninfected sub-populations <i>change significantly</i> and may eventually stabilize at some "equilibrium" level in the absence of interventions or other external impacts on the epidemic. As a result the trajectories of HIV epidemics and the number and sex-age composition of the infected and uninfected sub-populations vary significantly according to the specific characteristics of the individual populations. Consequently a single universal HIV-related age-pattern of mortality is unlikely, and even a single infected population is likely to reveal many different HIV-related age-patterns of mortality as the epidemic ages.

There is little reliable national-level data describing the distribution of deaths by cause for sub-Saharan Africa, and the WHO's mortality database (World Health Organization, 2003) lists HIV-related causes for only one sub-Saharan nation: South Africa in 1996 when roughly four percent of all deaths were attributed to HIV-related causes. These data have been superceded by work done by the South African Medical Research Council estimating that roughly 40 percent of deaths between ages 15 and 49 and 20 percent of all adult deaths in 2000 were attributable to HIV-related causes (Dorrington et al., 2001). Given the lack of reliable national-level data on cause of death, the South African study instead relied on indirect methods to estimate the levels of HIV-related mortality, and it is among very few credible national-level studies of HIV-related mortality in sub-Saharan Africa (Timæus, 1998).

This necessitates examination of sub-national, community-level data sources that are able to reveal the distribution of deaths by cause, including HIV-related causes. In 2001, the INDEPTH network

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published a collection of mortality data collected by demographic surveillance system (DSS) sites in Africa and Asia (*INDEPTH*, 2002b). Seven distinct age patterns of mortality were identified in that data set, two of which likely reflected a significant impact of HIV (*INDEPTH*, 2002a) in the form of significantly elevated mortality between ages 20 to 55 for males and 20 to 45 for females. The data contributing to those patterns was almost exclusively derived (92 percent) from sites in Tanzania and South Africa over the decade of the 1990s, all of which regularly conduct verbal autopsies (Caraël and Bernhard, 1998; Chandramohan et al., 1998; Kalter et al., 1990) on all deaths. As a result, these sites can describe the distribution of deaths by *likely* cause, including HIV, over the decade of the 1990s.

A recent examination of these cause-specific death data using cause-deleted life tables revealed an increase in the probability of dying between ages 15 and 50 associated with HIV-related causes of up to 127 percent for males and 153 percent for females (Clark et al., 2003). Plotting the age-specific HIV-related (including TB) mortality rates from those sites at the beginning 1990s and again at the end of the decade reveals three distinct age-patterns of HIV-related mortality, one describing an urban setting in Dar es Salaam, one for rural settings in Tanzania, and one for the comparatively young and rapidly growing epidemic in South Africa, see figures 3.b.1-3.b.4.

The figures reveal a comparatively mature (stable) epidemic in both rural and urban settings in Tanzania affecting adults between the ages of 20 and 60 in the rural settings and 20 and older in the urban setting. In the Tanzanian sites female HIV-related mortality rates are generally greater than male and the age distribution is younger, although in most of the Tanzanian sites the age distribution shifted up the age axis as time progressed.

The situation is different in the South Africa site where the epidemic appears much younger and still growing rapidly. At the beginning of the 1990s there was virtually no mortality associated with HIV, while at the end there was significant HIV-related mortality. In this case male HIV-related mortality is substantially greater and older than female HIV-related mortality. This reflects the youthfulness of the epidemic and the age differential of the typical sexual union in this society where women are typically several years younger than their partner.

These data clearly demonstrate the wide variety of age-patterns associated with HIV-related mortality and their dependence on the stage of the epidemic. They also clearly reveal the significant levels of HIV-related mortality in these settings and clearly show the substantial pace at which the epidemic is growing in the South African site

c. *United Nations Projected Age-Patterns of Overall Mortality*

The UN's AIDS Wall Chart provides estimates of the number and percent of adults aged 15-49 living with HIV/AIDS for all countries of the world during 2001 (where data are available) and the UN's World Population Prospects provide life tables for the same countries in five-year periods from 1990 to 2050. A meta analysis of these data for the current period 2000-2005 reveals the association between HIV prevalence and age-specific mortality. Although the details of the methods used to create the age-specific mortality patterns contained in the World Population Prospects are not revealed, it can be reasonably assumed that the period 2000-2005 is based largely on empirical observation of roughly the same period. Consequently, the association between estimated HIV prevalence in 2001 and age-specific mortality in the period 2000-2005 reasonably reflects reality rather than the workings of the UN's population projection machinery.

The following discusses relationships among the probability of dying (of all causes) and HIV prevalence among adults aged 15-49 of both sexes during 1999 for the 35 countries in Africa with HIV prevalence estimates of 1.0 percent or greater according to the AIDS Wall Chart. The first question is to what extent is the probability of dying at various ages is related to adult HIV prevalence. Figure 3.c.1

displays the relationship between the probability of dying for young children aged 0-4 and adults aged 15-49 and HIV prevalence among adults aged 15-49 (both sexes). It is immediately clear that there is a striking, positive, slightly curvilinear relationship between the probability of dying for adults and adult HIV prevalence, while for young children (mainly infected through vertical transmission) there is no real relationship – if anything, a slightly negative relationship. Keeping in mind that this is a meta analysis of the UN's data describing mortality and HIV prevalence in Africa, this suggests that there is a strong relationship between HIV prevalence and adult mortality, while for children a strong relationship has not yet been empirically identified. There are several explanations for the lack of a relationship between adult HIV prevalence and overall child mortality, including the suggestion by Timæus that continued improvements in child mortality are offsetting the impact of HIV/AIDS (Timæus, 1998), and the potential that the data describing this age group are not of sufficient quality to identify an impact.

Given that there is a strong positive relationship between HIV prevalence and adult mortality, the second question examines to what extent adult mortality among males and females may be affected differently. Figure 3.c.2 plots the adult female probability of dying against the adult male probability of dying (ages 15-49) for the 35 countries in Africa with estimated HIV prevalence of 1.0 percent or greater. Clearly, adult female and male probabilities of dying change at very similar rates, and this scatter plot can be well summarized by a line with slope 0.99 and intercept approximately 0.0.

Together figures 3.c.1 and 3.c.2 demonstrate that the overall mortality of both females and males aged 15-49 in these 35 African countries affected by HIV increases in very nearly the same increments as HIV prevalence increases.

Last, we examine the age-specific probability of dying inherent in the UN World Population Prospects life tables for 2000-2005 by the level of adult HIV prevalence for the same 35 African countries. As before, the countries are ranked by adult HIV prevalence and divided into five groups of seven countries each labeled: "high", "high-medium", "medium", "low-medium" and "low" prevalence. The median probability of dying in each age group across the members of each prevalence group is calculated to yield a group-wise median age-specific probability of dying. Figures 3.c.3 and 3.c.4 plot the male and female median age-specific probability of dying by prevalence group.

These figures reveal a very strong association between the age-pattern of the probability of dying and adult HIV prevalence. For both sexes, as the HIV prevalence increases the probability of dying between ages 20 and 60 increases while the probability of dying at other ages remains little changed. Importantly, the overall shape of the male and female HIV-related increases in age-specific probability of dying are significantly different, suggesting that the impact on males and females is different. The impact on females generally occurs at younger ages and is more "focused" in a narrower age band. This is consistent with the cause-specific HIV/TB mortality rates displayed in figures 3.b.1 through 3.b.4 from the community-based studies in Tanzania and South Africa and the fact that females often pair with males several years older than themselves. It is interesting to note that the maximum increases in age-specific probability of dying associated with each HIV prevalence group are of about the same magnitude for males and females, and taking into account the discussion of the differential impact of an HIV epidemic at various stages on mortality (section 3.b above), the UN age-specific mortality data must describe relatively mature epidemics (like the Tanzanian DSS site), or they are largely "estimates" generated by a similar modeling process that does not take into account the fact that the epidemics in each country are likely to be of different ages.

4. *Years of Life Expectancy Lost due to AIDS-Related Adult Deaths*

The substantial increases in adult mortality associated with HIV/AIDS reduce the average number of years a newborn can expect to live. Period estimates of the expectation of life at birth with and without HIV have been produced by the UN Population Division for countries in Africa with reasonable estimates

of adult HIV prevalence (United Nations Department of International Economic and Social Affairs, 2003a). Comparing these reveals that HIV/AIDS is reducing period life expectancy by from three to 34 years for males and females combined among the 35 African countries with adult HIV prevalence estimates of 1.0 percent or greater between ages 15-49, figure 4.1. Plotting the reduction in combined male and female loss in life expectancy associated with HIV by HIV prevalence reveals a linear association with about 0.93 years of life expectancy lost per one percent increase in HIV prevalence among adults aged 15-49. The intercept of the fitted line is 0.58 indicating that there is some non-linearity in this association near zero percent prevalence.

Plotting this association by country highlights the well known and previously discussed fact that Southern Africa is most seriously affected by the epidemic, figure 4.2. The eight countries with the highest prevalence and consequently the largest number of years of life expectancy lost are in Southern and Eastern Africa (in decreasing order of adult HIV prevalence): Botswana (34 years), Zimbabwe (26 years), Swaziland (25 years), Lesotho (24 years), Namibia (20 years), Zambia (17 years), South Africa (18 years), Malawi (14 years).

D. Conclusions

The HIV/AIDS pandemic is having significant impacts on adult mortality in sub-Saharan Africa. Southern Africa has the greatest proportion of adults infected with an average of 29.2 percent infected for the whole region. It does not, however, have the greatest number of HIV-related adult deaths because its base population is much smaller than Eastern Africa which, even though its average prevalence is only 11.5 percent, has more than twice as many HIV-related adult deaths, estimated at about 871 thousand during 2001.

The impact of HIV/AIDS on the age-pattern of adult mortality is striking with a very focused effect at reproductive ages – reflecting the simple fact that HIV is a sexually transmitted disease. Evidence from small longitudinal community-based studies indicates that the age dependence of the impact changes as an epidemic matures and larger numbers of adults become infected; usually broadening and becoming slightly older. For women the age-impact is usually younger and more focused in age, reflecting the fact that women typically pair with partners who are on average several years older than themselves. The UN national life tables reflect this age impact and contain a strong relationship between the magnitude of the impact and the prevalence of HIV among adults.

The number of years of life expectancy lost associated with HIV is a good gauge of the overall impact of HIV/AIDS the population. In the most severely effected countries in Southern Africa more than 30 years of life expectancy are being lost due to HIV/AIDS – indicating the devastating magnitude of the problem in these countries. As we expect from the strong relationship revealed between the magnitude of the age-specific impact of HIV/AIDS on adult mortality, there is a very strong linear relationship between the number of years of life expectancy lost and the prevalence of HIV among adults.

The strong age-specific impact of HIV on mortality is reshaping the population structure of African countries with substantial epidemics. The survival of adults in the worst effected countries is substantially reduced, which will eventually depopulate certain tiers of the age pyramid reducing the number of adults available to reproduce, and this together with the impact of HIV on fertility itself, will substantially alter the age distribution of severely impacted African population for many decades to come. Urgent action to halt the spread of HIV in sub-Saharan Africa is clearly needed.

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TABLE 1.1. HIV PREVALENCE AND LIFE TABLE PROBABILITY OF DYING

BETWEEN AGES 15 AND 45 ($_{45}q_{15}$) BY SEX IN 2000

Country	HIV Prevalence	$_{45}q_{15}$ Males	$_{45}q_{15}$ Females
Mauritius	0.1%	0.22789	0.10908
Madagascar	0.3%	0.38462	0.32181
Senegal	0.5%	0.35538	0.30280
Somalia	1.0%	0.59610	0.45244
Gambia	1.6%	0.37289	0.32019
Mali	1.7%	0.51791	0.43305
Eritrea	2.8%	0.49264	0.44118
Guinea-Bissau	2.8%	0.42152	0.37072
Ghana	3.0%	0.37950	0.32603
Eq. Guinea	3.4%	0.33883	0.27972
Benin	3.6%	0.38364	0.32787
Chad	3.6%	0.44864	0.36058
DRC	4.9%	0.57106	0.49265
Uganda	5.0%	0.61658	0.56722
Angola	5.5%	0.49196	0.38606
Nigeria	5.8%	0.44257	0.39309
Togo	6.0%	0.45960	0.40589
Ethiopia	6.4%	0.59409	0.53489
Burkina Faso	6.5%	0.55887	0.50730
Sierra Leone	7.0%	0.58689	0.53090
Congo	7.2%	0.47477	0.40592
UR of Tanzania	7.8%	0.59617	0.51953
Burundi	8.3%	0.59135	0.52379
Rwanda	8.9%	0.66680	0.59912
Cote-d'Ivoire	9.7%	0.55270	0.55396
Cameroon	11.8%	0.48795	0.43989
CAR	12.9%	0.62014	0.57316
Mozambique	13.0%	0.62025	0.61245
Kenya	15.0%	0.57765	0.52904
Malawi	15.0%	0.70062	0.65325
South Africa	20.1%	0.56718	0.50155
Zambia	21.5%	0.72465	0.74851
Namibia	22.5%	0.69471	0.66118
Lesotho	31.0%	0.66717	0.62959
Swaziland	33.4%	0.62740	0.58663
Zimbabwe	33.7%	0.64985	0.61216
Botswana	38.8%	0.70287	0.66915
Comoros	0.7%	0.38086	0.32509
Djibouti	12.4%	0.58989	0.54095
Gabon	0.7%	0.37688	0.33007
Guinea	1.4%	0.43209	0.36632
Liberia	1.8%	0.44844	0.38526
Mauritania	0.5%	0.35740	0.30166
Niger	2.5%	0.47308	0.40798

Source. HIV prevalence rates are from UNAIDS 'Barcelona Report' Report on the Global HIV/AIDS Epidemic, 2002; $_{45}q_{15}$ are from (Lopez et al., 2002)

TABLE 2.1. HIV DEATHS, TOTAL POPULATION AND CRUDE HIV MORTALITY RATE FOR ADULTS
15-49 IN AFRICAN NATIONS WITH ADULT HIV PREVALENCE OF ONE PER CENT IN 2001

Country	Region	Prevalence	HIV Deaths	Total Population	Crude HIV Mortality Rate per 1,000
High Prevalence		**28.7%**			
Botswana	Southern	38.8%	21,500	762,273	28.21
Zimbabwe	Eastern	33.7%	155,000	5,971,925	25.95
Swaziland	Southern	33.4%	9,300	449,922	20.67
Lesotho	Southern	31.0%	20,500	984,374	20.83
Namibia	Southern	22.5%	9,950	819,505	12.14
Zambia	Eastern	21.5%	90,000	4,739,546	18.99
South Africa	Southern	20.1%	350,000	23,665,723	14.79
High-Medium Prevalence		**12.3%**			
Kenya	Eastern	15.0%	150,000	15,332,939	9.78
Malawi	Eastern	15.0%	60,000	5,118,068	11.72
Mozambique	Eastern	13.0%	65,000	8,511,340	7.64
Central African Republic	Middle	12.9%	17,500	1,722,283	10.16
Cameroon	Middle	11.8%	39,000	7,064,530	5.52
Côte d'Ivoire	Western	9.7%	59,000	7,854,047	7.51
Rwanda	Eastern	8.9%	36,500	3,755,551	9.72
Medium Prevalence		**7.0%**			
Burundi	Eastern	8.3%	29,000	2,887,450	10.04
United Republic of Tanzania	Eastern	7.8%	108,000	16,701,418	6.47
Congo	Middle	7.2%	8,250	1,364,196	6.05
Sierra Leone	Western	7.0%	8,100	2,093,271	3.87
Burkina Faso	Western	6.5%	32,500	5,046,101	6.44
Ethiopia	Eastern	6.4%	117,000	28,952,496	4.04
Togo	Western	6.0%	9,200	2,151,727	4.28
Low-Medium Prevalance		**4.5%**			
Nigeria	Western	5.8%	140,000	53,346,480	2.62
Angola	Middle	5.5%	16,000	5,767,198	2.77
Uganda	Eastern	5.0%	60,000	10,289,941	5.83
Democratic Republic of the Congo	Middle	4.9%	86,500	22,072,719	3.92
Chad	Middle	3.6%	10,300	3,569,993	2.89
Benin	Western	3.6%	5,850	2,929,324	2.00
Equatorial Guinea	Middle	3.4%	265	210,569	1.26
Low Prevalence		**2.2%**			
Ghana	Western	3.0%	23,000	9,700,472	2.37
Guinea-Bissau	Western	2.8%	880	556,716	1.58
Eritrea	Eastern	2.8%	320	1,760,190	0.18
Sudan	Northern	2.6%	17,000	15,495,690	1.10
Mali	Western	1.7%	8,100	5,096,269	1.59
Gambia	Western	1.6%	280	647,331	0.43
Somalia	Eastern	1.0%		4,015,330	-NA-

Source. UNAIDS 'Barcelona Report' Report on the Global HIV/AIDS Epidemic, 2002.

TABLE 2.2. HIV DEATHS, TOTAL POPULATION AND CRUDE HIV MORTALITY RATE FOR ADULTS 15-49 IN
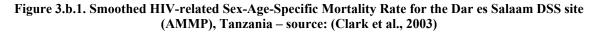AFRICAN NATIONS WITH ADULT HIV PREVALENCE OF ONE PERCENT AND GREATER IN 2001
SUMMARIZED BY REGION AND PREVALENCE GROUP

	HIV Deaths	Total Population	Crude HIV Mortality Rate per 1,000	Average Prevalence (%)
Region				
Southern Africa	411,250	26,681,797	15.41	29.2%
Eastern Africa	870,820	108,036,194	8.06	11.5%
Middle Africa	177,815	41,771,488	4.26	7.0%
Western Africa	286,910	89,421,738	3.21	4.8%
Northern Africa	17,000	15,495,690	1.10	2.6%
Prevalence Group				
High Prevalence	656,250	37,393,267	17.55	28.7%
High-Medium Prevalence	427,000	49,358,758	8.65	12.3%
Medium Prevalence	312,050	59,196,659	5.27	7.0%
Low-Medium Prevalence	318,915	98,186,225	3.25	4.5%
Low Prevalence	49,580	37,271,998	1.33	2.2%

Source. UNAIDS 'Barcelona Report' Report on the Global HIV/AIDS Epidemic, 2002.

Figure 3.b.1. Smoothed HIV-related Sex-Age-Specific Mortality Rate for the Dar es Salaam DSS site (AMMP), Tanzania – source: (Clark et al., 2003)
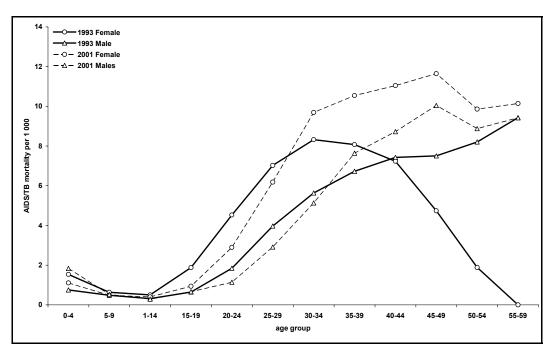

Figure 3.b.2. Smoothed HIV-related Sex-Age-Specific Mortality Rate for the Hai District DSS site (AMMP), Tanzania – source: (Clark et al., 2003)
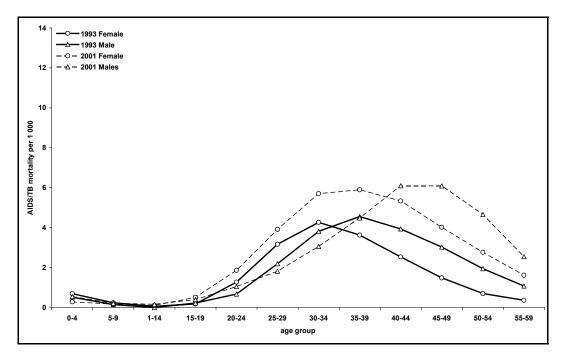
Figure 3.b.3. Smoothed HIV-related Sex-Age-Specific Mortality Rate for the Morogoro District DSS site (AMMP), Tanzania – source: (Clark et al., 2003)
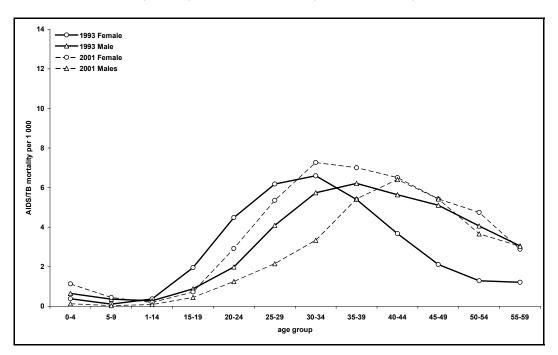

Figure 3.b.4. Smoothed HIV-related Sex-Age-Specific Mortality Rate for the Agincourt DSS site, South Africa – source: (Clark et al., 2003)

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Figure 3.c.1. Probability of Dying by HIV Prevalence (ages 15 to 49) for 35 Countries in Africa with HIV Prevalence Estimates of 1.0 percentor Greater, Males and Females Combined. (source: UN AIDS Wall Chart, accessed July, 2003, UN Population Prospects 2002 Revision, and the UNAIDS 'Barcelona Report' Report on the Global HIV/AIDS Epidemic, 2002)
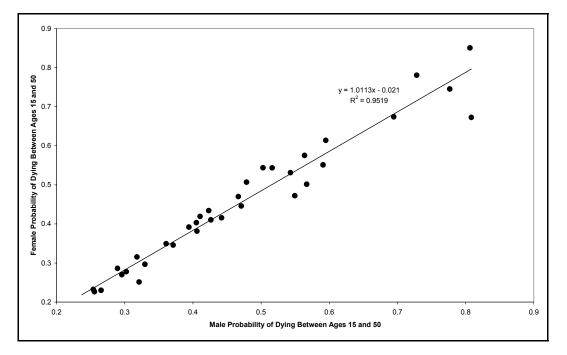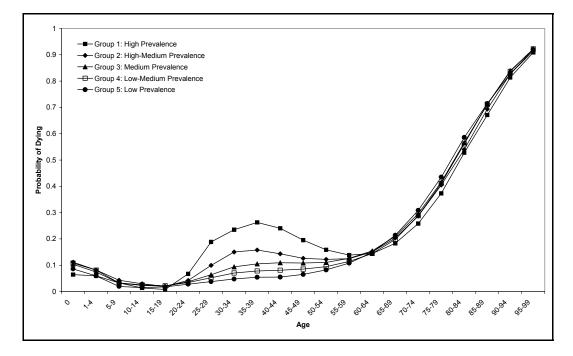

Figure 3.c.2. Female Probability of Dying between Ages 15 and 50 by Male Probability of Dying between Ages 15 and 50 for 35 Countries in Africa with HIV Prevalence Estimates of 1.0 percentor Greater. (source: UN AIDS Wall Chart, accessed July, 2003, UN Population Prospects 2002 Revision, and the UNAIDS 'Barcelona Report' Report on the Global HIV/AIDS Epidemic, 2002)

Figures 3.c.3. Median UN Projected Male Age-Specific Probability of Dying 2000-2005 by HIV Prevalence Group for 35 Countries in Africa with HIV Prevalence Estimates of 1.0 percentor Greater. (source: UN AIDS Wall Chart, accessed July, 2003, UN Population Prospects 2002 Revision, and the UNAIDS 'Barcelona Report' Report on the Global HIV/AIDS Epidemic, 2002)

Figures 3.c.4. Median UN Projected Female Age-Specific Probability of Dying 2000-2005 by HIV Prevalence Group for 35 Countries in Africa with HIV Prevalence Estimates of 1.0 percentor Greater. (source: UN AIDS Wall Chart, accessed July, 2003 and UN Population Prospects 2002 Revision, and the UNAIDS 'Barcelona Report' Report on the Global HIV/AIDS Epidemic, 2002)
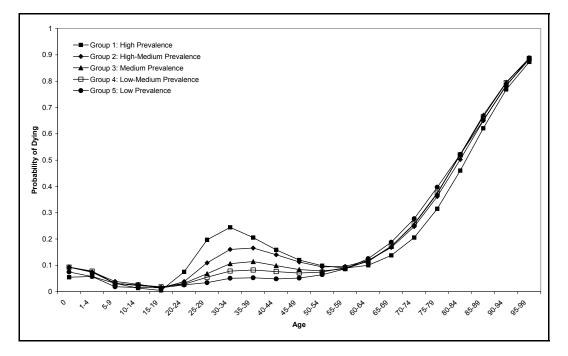
Figure 4.1. Years of Expectation of Life at Birth Lost Associated with HIV by National HIV Prevalence (ages 15-49) for 35 Countries in Africa with HIV Prevalence Estimates of 1.0 percentor Greater, Males and Females Combined. (source: UN AIDS Wall Chart, accessed July, 2003, and the UNAIDS 'Barcelona Report' Report on the Global HIV/AIDS Epidemic, 2002)
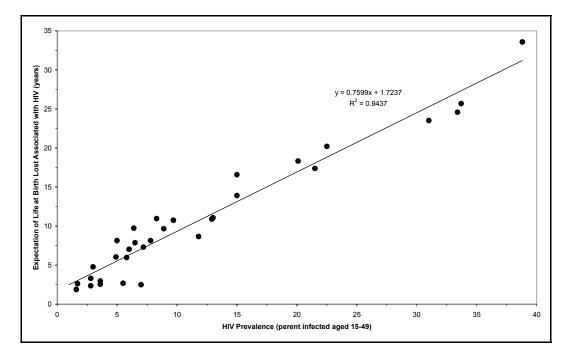

Figure 4.2. HIV Prevalence (ages 15-49) and Years of Expectation of Life at Birth Lost Associated with HIV by Country for 35 Countries in Africa with HIV Prevalence Estimates of 1.0 percentor Greater, Males and Females Combined. (source: UN AIDS Wall Chart, accessed July, 2003, and the UNAIDS 'Barcelona Report' Report on the Global HIV/AIDS Epidemic, 2002)