

**AIID annual workshops on the Economic Consequences of AIDS
Amsterdam, December 2006, 2007 and 2008**

Summary of Papers and Discussion
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Please find the papers and presentations presented at the workshops at the end of this summary. To read the full papers or presentations click on the title in the list of references.

If nothing is done to combat the epidemic, a complete economic collapse will occur in three generations. Bell et al.,2003.

The AIDS epidemic, on net, enhances the future per capita consumption possibilities of the South African economy. Alwyn Young, 2004.

The human suffering as a result of the HIV/AIDS pandemic is there for all to see. Since the first confirmed case in 1981, 22 million people have died of AIDS (and AIDS related infections), more than 33 million currently live with AIDS, and every year more than 5 million additional people are infected. In some countries, especially in Sub-Saharan Africa (SSA), decades of progress in life expectancy have been wiped-out by the pandemic.

The economic consequences of all of this are being hotly contested, as the two quotes above show. Serious researchers (in this case, both looking at the same country) come to vastly different conclusions. The Amsterdam Institute for International Development (AIID) is holding annual workshops to discuss the causes of such differences and to determine what additional research is needed to bring more clarity to this, and other HIV/AIDS related issues. About 30 scholars came together in December 2006, and again in December 2007 and 2008, to discuss recent research on the economic impact of HIV/AIDS. This note summarizes the main results of the papers and the discussions from the workshops.¹

Starting off the first workshop, **Clive Bell** presented a paper titled “Economic Growth, Education, and AIDS in Kenya: a Long-run Analysis” (co-authored with Ramona Bruhns and Hans Gerlach). The paper presents an overlapping generations model. The core idea of the model is that HIV/AIDS not only destroys existing human capital, but also impairs the country’s ability to produce future human capital. The workforce of subsequent

¹ The papers are attached. Alwyn Young did not attend, but his paper is mentioned because it starkly shows how alternative approaches to modeling the economic consequences of AIDS can lead to different results.

generations will experience a steady decline in schooling levels, which negatively effects economic growth potential. The model is calibrated on demographic and economic time-series data for Kenya, for the period 1950-1990, and extrapolated till 2050. Two factors play a key role in the Bell et al. paper: first of all, the assumption that fertility is unaffected by the increase in mortality and second, orphaned children build no further human capital. Both factors receive extensive scrutiny in the microeconomic papers that were subsequently presented at the workshops.

The main conclusion of this study is: *although AIDS does not bring about a catastrophic economic collapse, it does cause large economic costs*". The paper also shows how a combination of interventions in health and education can mitigate the economic impact.

Broadly speaking, the paper is similar to the earlier work of Bell et al. (quoted above), which was calibrated for South Africa. This begs the question: why do Young and Bell come to such contrasting conclusions? The Young paper also focuses on the destruction of human capital, but in addition assumes a continuing decline in the fertility rate and, contrary to the Bell studies, incorporates physical capital accumulation. Declining fertility in the presence of physical capital leads to upward pressure on real wages, as the per capita stock of physical capital increases. When the fertility effect dominates, as is assumed in Young's study, one finds a net positive effect on GDP/cap.

Sebnem Kalemli-Ozcan looks at the available empirical evidence of the effect of HIV/AIDS on both school enrollment and fertility rates. She finds that enrollment rates are lower in countries with a high prevalence of AIDS, while fertility rates are affected positively. The data used (cross-section of panel data at the country level) are far from ideal, but the results stand up to various tests. The increasing, rather than declining, fertility rates contradict Young's assumption and would reverse his conclusion of a long term rise in real wages.

In subsequent work, presented at the second workshop, **Kalemli-Ozcan** pursues the same question regarding the effect on fertility, using micro data from recent DHS surveys that include HIV test results. The new paper, co-authored with Chinhui Juhn and Belgi Turan, and titled "HIV and Fertility in Africa: first evidence from population based surveys", looks at the impact on fertility of a woman's own HIV-status, as well as the impact of community HIV prevalence on the fertility of non-affected women.

The effect on a woman's own fertility of being HIV positive is consistently found to be negative. Being infected with HIV reduces the last year's birth by somewhere between 24 and 27 percent. The effect of community prevalence rates on the fertility of non-infected women proved harder to pin down. When using data from all communities the authors do not find a statistically significant effect. However, when they restrict the analysis to communities with non-zero prevalence, the effect on fertility is positive and statistically significant. Given that the number of non-infected women is much larger than that of HIV-positive women, and given the well-documented negative effect of the epidemic on human capital formation, the authors conclude that the combination of increased fertility and declining human capital stocks is likely to decrease rather than increase future per capita incomes in Africa.

In 2008, three papers addressed the same question regarding the impact of HIV/AIDS on fertility. **Kalemli-Ozcan**, in a paper titled HIV and Fertility Revisited, takes a closer look at Young's work (including the recent paper In Sorrow to bring forth children; A.Young, Journal of Economic Growth, 12(4), 2007). She shows that the earlier negative effect found by Young on South Africa, turns positive when the sample is restricted to post-1990 data. When pooled data are used for 27 African countries, the effect of HIV on fertility is no longer significant.

A similar effect, no impact of HIV on fertility is found by **Jane Fortson** in the paper HIV/AIDS and fertility. Jane used repeated cross-sections data of the DHS surveys for 12 African countries.

Fink and Linnemayer, in a paper titled HIV, Education, and Fertility: long-term evidence from Sub-Saharan Africa, also find that, on average, there is little systematic relationship between HIV and fertility. However, this result masks important heterogeneity across educational groups. While women with little or no schooling increase their fertility in the presence of HIV, higher educated women decrease their fertility.

In sum, the current evidence suggests that there is little or no systematic impact of HIV on fertility, on average. If this result holds up, the "optimistic" results of Young no longer hold while the work of Clive et al. showing the detrimental impact of HIV/AIDS on long-term per capita growth may be closer to the truth. The paper by Fink and Linnemayer suggest that the impact may be the largest for those already at the bottom of the social pyramid.

Of course, as was pointed out rather forcefully in the discussion, the focus on real wages and per capita GDP of survivors is too narrow a focus for welfare analysis. The misery of the sick and the welfare foregone of those dying prematurely should also carry weight (as Alwyn Young also points out). A complete welfare analysis should take these factors into account too, difficult as that may be methodologically, and would, all participants agreed, doubtlessly show the negative overall impact of HIV/AIDS on economic welfare.

The negative impact of HIV/AIDS on existing and future human capital has already been recognized. During the first workshop, two papers addressed this issue further.

The first one, by **Paul Gertler** et al., "The presence and Presents of Parents: How parental Death and Disability Affects Children", looks at the consequences of parental death and disability (not only due to AIDS) for investment in children in Indonesia. The paper explicitly differentiates the economic impact of parental death on children from the emotional impact. The economic effect does exist, but the emotional impact appears to be stronger. The paper addresses the policy implications of these findings. They suggest that the economic impact can be mitigated by financial institutions (e.g. scholarships, life insurance), but that - in addition - programs need to be designed to provide emotional

support, guidance, tutoring and other services to complement scholarships and financial aid for disadvantaged orphans.

Anne Case, in her paper titled “The Care and Future of Orphans in Africa” addresses similar questions: “Are orphans more at risk of poor outcomes than other children? Are children who lose parents to AIDS at special risk?” She points out that, in South Africa, the number of children under 18 years of age who have lost one or both parents to AIDS will have reached 5.7 million in 2015, nearly one third of all children.

Summarizing the literature, she reports that orphans are more at risk of drop out and show lower enrollment rates than the children with whom they live. However, particularly in African villages, they may not be all that much worse off than they would have been in their original families, as orphans are often entrusted to the richer inhabitants of the village. She also reports on very different care patterns of how orphanhood can effect children’s well-being. For instance, while paternal orphans are likely to live with their mother, only a quarter of maternal orphans live with their father. Clearly, more research is needed about the various pathways through which AIDS related parental death effects children’s outcomes. Most of the existing research is based on cross-sectional data, but it is important to keep following these children over time. Long-run effects may be important. One study shows that young adults who were orphaned as young children, show lower levels of labor force participation and job-seeking behavior, and increased levels of (risky) sexual behavior, resulting in higher levels of pregnancy, AIDS, and other sexually related infections. The question of whether AIDS orphans are worse off than other poor children is of the utmost policy importance as the answer to that question has important long-term economic implications.

In 2008, **Case** presented two additional papers. The first, co-authored with Anu Garrib, Alicia Menendez and Nanalia Olgiati, is titled *Paying the Piper: the High Cost of Funerals in South Africa*. The authors analyze funeral costs of 3751 people who died in 2003-2005 in the Africa Centre Demographic Surveillance Area. Households spend the equivalent of a year’s income on an adult funeral. They take out loans and use potentially productive resources to pay for this, thus draining their household resources and reducing their future ability to increase welfare and invest in their children.

The second paper, titled *The Impact of the AIDS Pandemic on Health Services in Africa*, is co-authored with Christina Paxon. The authors use multiple waves of DHS survey data to examine antenatal care, birth deliveries and rates of immunization. The shocking conclusion is that that all these indicators of health service delivery are deteriorating and that this erosion is highly correlated with HIV prevalence levels.

During the second workshop, **Joachim De Weerd** presented new evidence on “Orphanhood and the long-run impact on children”. The paper, co-authored by Kathleen Beegle and Stefan Dercon, uses a unique set of panel data collected in Northwestern Tanzania. The first rounds of data collection took place in 1991-1994, and the households were revisited 14 years later. Twenty three percent of the children present in the first round lost one or both parents before the age of 15. A substantial proportion had reached

adulthood at the time of the second survey, thus allowing for the determination of the long-run impact of orphanhood shocks. The focus of the study was on future health status (proxied by height) and educational attainment. The robust results show, that maternal orphanhood reduces schooling on average by about one year, or 13 percent, but the effect is much larger for children who are not yet enrolled when a parent dies. In that case schooling is reduced by two-thirds. The effect on height shows a permanent reduction (into adulthood) of about 2 centimeters. Given the large existing literature on the impact of health and educational attainment on (future) earnings, these results contribute to the evidence that the HIV/AIDS epidemic will have a large and persistent negative effect on future welfare through the erosion of human capital.

Three additional papers were presented at the first workshop.

Hans Binswanger presented a comprehensive research and data collection agenda to improve the design and implementation of “Food and Agricultural Policies to Mitigate the Impact of HIV/AIDS”. He draws attention to the complicated interactions of environmental, behavioral, and bio-medical determinants, impacts and responses regarding AIDS and AIDS policies. As Ann Case, and other participants, he concludes with a strong plea *“to develop multi-purpose panel data sets on households and communities that can be used to address a broad range of HIV/AIDS questions,...”*(italics in original).

Markus Haacker provided a public policy perspective in “HIV/AIDS, Public Policy, and Development in the “New Age” of Expanded Access to Treatment”. With the new reality of access to treatment (and the financial implications of this) clearly in mind, Haacker looks at the consequences for social security systems, pensions and medical benefits. He also addresses the impact on the government’s resource envelope and overall financial implications. Finally he looks at human resource implications and migration patterns of badly needed medical personnel.

In one of his strongest conclusions he states: HIV/AIDS complicates public policy by eroding the government’s capacities, both in terms of human resources and in terms of fiscal resources. Specifically, we find that, in the context of external finance for HIV/AIDS programs, a number of fiscal effects (benefits, pensions, certain kinds of social expenditures) have a disproportionate impact on the government’s resource envelope.

It is worth mentioning that none of the papers that looked at the impact of HIV/AIDS on the economy, included this kind of effect on the government’s ability to address the impact of AIDS.

Haacker presented a second paper at the workshop in 2007. The paper is titled “HIV/AIDS as an Economic Development Risk in South Asia”. The paper, which is part of a larger study on the economic effects of HIV/AIDS on Asia², takes a comprehensive (macro) look at the impact. It starts out by noting that HIV prevalence is relatively low

² This study will soon be published in book form.

compared to other parts of the world, being responsible for about 1.5% of all death in South Asia (comparable with measles and diabetes). In theory the relatively low prevalence rate would facilitate access to treatment, but Haacker finds generally low rates of access, something that can not to be explained by differences in access to external aid. Part of it is due to low capacity of the health systems in the region, but Sri Lanka, with a decent health care system, also shows low access to antiretroviral drugs, while Cambodia, with low capacities in its basic health system, is doing much better.

Haacker estimates that the impact of HIV/AIDS on GDP per capita is small. For India the effect is about -0.16 percent. However, using a more comprehensive welfare measure, overall welfare losses are estimated to be 3-4 percent. He also points to the potentially large impact of treatment on the poorest households. He also points out that the lack of data on the socio-economic dimension of HIV/AIDS in South Asia limits our knowledge of the extent and determinants of the impact of the epidemic.

Alan Whiteside, at the second workshop, presented a similar macro view, but instead of covering an entire region, his focus is on one small country, Swaziland. In his paper titled “The AIDS Impact on Economic and Other Development Indicators; the Case of Swaziland”, Whiteside starts off by noting that, based on sentinel surveys conducted every two years, Swaziland has the highest HIV prevalence ever recorded anywhere in the world. The prevalence peaked at 42.6% in 2004. By 2006 it had slightly fallen to 39.2 percent. Among women 25-29 years of age, it was an astonishing 56.3 percent. The results of the 2007 DHS survey show an overall population prevalence rate of 18.8 percent.

Whiteside points out that the HIV epidemic hit an economy that is already showing poor performance. HIV death rates are highest in the 16-35 age group, thus reducing the productive age groups and increasing economic dependency. Responses from both within the country and internationally are, thus far, insufficient to avoid a crisis.

The final paper of the 2006 workshop was presented by **Judith Lammers**. It was titled ‘Perceived HIV-contamination risk, risk aversion and time preferences (a laboratory experiment in South Africa)’ (co-authored with Morten Lau and Harrie Verbon). The paper presents first results from a unique laboratory experiment that aims at measuring individual time and risk preferences for individuals with and without HIV/AIDS. The authors find that subjects with high-perceived HIV-contamination risk are less risk averse (even risk seeking) and have higher discount rates. HIV positive subjects are significantly less risk averse as well. It was pointed out in the discussions, however, that a number of methodological questions needed to be addressed before drawing strong conclusions from these results.

Some of these issues were addressed in a follow-up paper, co-authored with **Sweder van Wijnbergen**, which was presented at the second workshop.

In the 2007 workshop an attempt was made to highlight the impact on the productive sector, through increased absenteeism, reduced productivity, higher labor turnover, etc.,

and the prospects that HAART could mitigate these effects. **Bruce Larson** presented a paper titled “Early Effects of Antiretroviral Therapy on Work Performance: Results from a Cohort Study of Kenyan Agricultural Workers”³. Using preliminary data from an ongoing cohort study of tea estate workers in Kenya who receive ART through their company hospital, the authors evaluate four productivity outcomes: days per months picking tea, days devoted to less strenuous tasks, total days working per months and the quantity of tea harvested. They find that the workers on ART quickly returned to their primary work assignment (plucking tea) during the initial 12 months on ART and that men quickly returned to nearly similar work patterns as the general workforce. Women, on the other hand, continued to spend fewer days on plucking tea, but more days on doing other tasks.

The authors speculate that while the results are for tea pluckers only, there is every reason to believe that ART can restore normal functioning quickly among non-formal sector workers in rural areas, but there are two caveats: first, tea pluckers are not generally poor or malnourished and, second, they have good access to high quality care on the plantation, where barriers to ART are low (in terms of transportation and other costs).

Rich Feeley gave a presentation on ‘Low Cost Health Insurance Plans in Namibia’, and laid out his research plans on the effect on productivity in the companies that buy these plans (which include coverage for HAART).

Two additional papers on work in progress were presented at the second workshop:

Jean Marie Baland, in joint work with Gani Aldashev, gave a presentation titled “ A political Economy Model of Aids Treatment and Prevention. And Wendy Janssens, in a paper co-authored with Jacques van de Gaag and titled Some Pitfalls in the estimation of HIV prevalence, showed preliminary results of the bias that can arise as a result of refusal to take the voluntary HIV test that is now part of many DHS and other household surveys. Those who refuse to take the test may be four to five times as likely to be HIV positive as participants in the test.

During the 2008 workshop, Achyuta Adhvaryu and Kathleen Beegle presented a paper on The Impacts of Adult Health on the Elderly in Tanzania. They showed that over a period of up to thirteen years, elderly household members steadily increase their labor supply in response to an earlier death of another adult household member. The effect is larger for elderly women than for men. Life stock assets can mitigate the increase in labor supply.

Sydney Rosen presented the paper Cost and Cost-Effectiveness of Switching from Stavudine to Tenofovir in First-Line Antiretroviral Regimens in South Africa (co-authored with Lawrence Long, Mathew Fox and Ian Sanne. Using a model developed to estimate the proportion of patients in a hypothetical cohort who experienced d4T and TDF-related events, the authors estimate that, due to savings on d4T toxicity

³ Co-authored with M.P.Fox, S.Rosen, M.Bii, C.Sigei, D.Shaffer, F.Sawe, K.McCoy, M.Wasunna, and J.L.Simon.

management, TDF would be highly cost effective at a price only slightly below what is currently available.

Maria Damon presented the paper Health Shocks and natural Resource Management: Evidence from Western Kenya (with Joshua Zivin as co-author). The authors point out that the effect of disease (in this case HIV) on natural resource management is hard to predict. Sicker households are less able to extract natural resources, but also have a diminished incentive to conserve them. The empirical work shows no effect on land fallowing (a method of land preservation). However, this average result masks significant heterogeneity. Large households fallow more when they become healthier, while small households do significantly increase their consumption, possibly at the expense of the environment.

Marjorie Opuni presented the paper titled Preferences for Characteristics of antiretroviral therapy provision in Johannesburg, South Africa: Results of a conjoint analysis (with David Bishai, Glenda Gray, James McIntyre and Neil Armstrong as co-authors). The authors administered a survey to HIV infected patients in Soweto and Johannesburg to measure preferences for antiretroviral provision. Respondents could show their preferences for price levels, waiting time, staff attitudes and the HIV-branding of clinics. Staff attitudes scored particularly high. The method allows for putting a dollar value on the preference for each of the four characteristics.

Angus Deaton presented the paper titled Life(evaluation), HIV/AIDS, and death in Africa (with Jane Fortson and Robert Tortora as co-authors). Using data from the Gallup World Poll and from DHS surveys, the authors investigate how subjective wellbeing is affected by mortality in Sub-Saharan Africa. A life evaluation measure (Cantril's ladder of life) is relatively insensitive to death in the immediate family. The effect on experiential measures, such as sadness and depression proves to be much larger. The authors conclude that since experiential and evaluative measures are not the same thing, they cannot be used interchangeably as measures of "happiness" in welfare economics.

The next workshop will be held in December 2009. For information contact:
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Papers / Presentations workshop 2008

Angus Deaton, Jane Fortson and Robert Tortora

Life (evaluation), HIV/AIDS, and Death in Africa

Sydney Rosen, Laurence Long, Matthew Fox and Ian Sanne

Cost and Cost-Effectiveness of Switching From Stavudine to Tenofovir in First-Line Antiretroviral Regimens in South Africa

Paul Gertler and Manisha Shah

Sex Work and Infection: What's Law Enforcement Got to Do with it?

Sebnem Kalemli –Ozcan

HIV and Fertility Revisited

Achyuta Adhvaryu and Kathleen Beegle

The impacts of adult deaths on the elderly in Tanzania

Anne Case and Christina Paxson

The impact of the AIDS pandemic on health services in Africa: Evidence from Demographic Health Surveys

Joshua Graff Zivin and Maria Damon

Health Shocks and Natural Resource Management: Evidence from Western Kenya

Anne Case, Anu Garrib, Alicia Menendez and Analia Olgiati

Paying the Piper: The High Cost of Funerals in South Africa

Marjorie Opuni, David Bishai, Glenda Gray, James McIntyre and Neil Martinson

Preferences for characteristics of antiretroviral therapy provision in Johannesburg, South Africa: Results of a conjoint analysis

Günther Fink and Sebastian Linnemayr

HIV, Education, and Fertility: Long-term Evidence from Sub-Saharan Africa

Jane Fortson

HIV/AIDS and Fertility

Papers / Presentations workshop 2007

Sebnem Kalemli-Ozcan, Chinhui Juhn, Belgi Turan

Hiv and Fertility in Africa: First evidence from population based surveys

Kathleen Beegle, **Joachim de Weerd** and Stefan Dercon

Orphanhood and the long-run impact on children

Mead Over, Damien de Welgue, Hartounian Kazianga

**The Impact of ART Awareness on Risk Behavior
Among Non-Patients in Ghana and Burkina Faso (*only
Power Point - PP*)**

Alan Whiteside

**The AIDS impact on Economic and Other Development
Indicators: The Case of Swaziland**

Rich Feeley

**Health Insurance for Low-Income workers in Africa a:
Can it address the AIDS epidemic? – The experience
from Namibia**

Bruce Larson a.o.

**Early Effects of Antiretroviral Therapy on Work
Performance: Results from a Cohort Study of Kenyan
Agricultural Workers**

Jean-Marie Baland and Gani Aldashev

**A political Economy Model of Aids Treatment and
Prevention (*only PP*)**

Markus Haacker

**HIV/AIDS as an Economic Development Risk in South
Asia**

Sweder van Wijnbergen and Judith Lammers

HIV/AIDS, Risk Aversion and Intertemporal Choice.

Wendy Janssens, Tobias Rinke de Wit and Jacques van der Gaag

**Selectivity Bias and HIV/AIDS Prevalence
Measurements (*only PP*)**

Papers workshop 2006

Clive Bell, Ramona Bruhns, Hans Gersbach

**Economic Growth, Education and AIDS in Kenya: A
Long-run Analysis**

Paul Gertler, David Levine, Sebastian Martinez

**Lost Presence and Presents: How Parental Death
Affects Children**

Sebnem Kalemli-Ozcan

**AIDS, Reversal of the Demographic Transition and
Economic development : Evidence from Africa**

Anne Case and Christina Paxson

The Care and Future of AIDS Orphans

Markus Haacker

The impact on the Public Sector

Hans Binswanger

Food and Agricultural Policy Responses to HIV/AIDS

Judith Lammers, Morton Lau, Harrie A.A. Verbon

Perceived HIV-contamination risk, risk aversion and time preferences (A laboratory experiment in South Africa)

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