

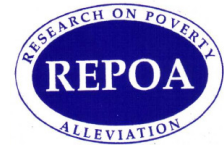
A Paper to Contribute to a Debate for the Joint Learning Initiative on Children and AIDS

**“Can a Developing Country Support the Welfare Needs of Children Affected by
AIDS?”**

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Paper submitted to the Joint Learning Initiative on Children and AIDS
Learning Group 4: Social and Economic Policies

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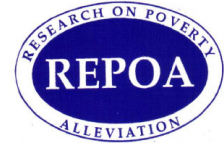
The Case for Public Action on AIDS Orphans

Abstract. *Drawing on macro- and microeconomic evidence, we show that there is a case for public action on AIDS orphans not just on humanitarian grounds, but also on grounds of economic efficiency and growth. Absent public action, AIDS orphans are likely to be under-educated as well as to miss out on the life-skills that children typically learn from their parents. This can lead to a vicious cycle where each generation is less educated than its predecessor, and an otherwise growing economy shrinks to a fraction of its size. Public action can avoid this outcome by (i) keeping HIV-infected parents alive as long as possible; (ii) preventing new infections; and (iii) supporting orphans with education and other subsidies.*

According to economic theory (Samuelson [1954]), public action is justified on two grounds: (i) if there is a market failure, such as the existence of public goods or externalities; or (ii) for redistributing resources from rich to poor people. From this perspective, the case for public action to help AIDS orphans is mainly based on the redistributive rationale. The situation of these orphans is tragic. In addition to losing their parents, AIDS orphans may have contracted the disease themselves. The stigma associated with HIV/AIDS often leaves them excluded from family and social networks. To the extent that governments are committed to helping the most vulnerable members of society, surely AIDS orphans deserve significant public spending. Inasmuch as some of these orphans may resort to crime, prostitution and drugs, with possible spillover effects on the rest of society, there is a “public-good” aspect to assisting AIDS orphans, but this is often a secondary consideration.

Meanwhile, there are numerous competing demands on scarce government budgets, including ones that address public goods and externalities. For instance, infrastructure could generate major benefits for the entire population. Crowding out this kind of expenditure by spending large sums of money on a minority group such as AIDS orphans may seem like a wasteful decision. Furthermore, in the real world, much of public expenditure is driven by politics, and AIDS orphans have almost no political clout. It is not surprising therefore, that governments are sometimes reluctant to increase spending on this particular group.

This paper shows that there is a case for investing significant amounts of public resources on AIDS orphans—not on redistributive grounds, but on grounds of economic efficiency and growth. The argument, as developed by Bell, Devarajan and Gersbach [2006]), is based on two facts. First, an economy’s long-run growth is determined by the accumulation of human capital—education, skills



and knowledge--by its population. Second, AIDS is a disease that primarily affects young adults, many of whom are in the process of child-bearing and child-rearing. Consequently, the victims of AIDS are not just those directly afflicted with the disease, but also their children. Too often, the children are pulled out of school, or never go to school, because of financial hardship and the need to care for their parents and younger siblings. Worse still, when the parent dies, their children lose out on the love and affection, not to mention life-skills, which parents typically provide. As a result, many AIDS orphans face a double hit in their accumulation of human capital. Not only are they denied a formal education, but they also miss out on the parental knowledge and wisdom that make the investment in education productive.

In poor countries with high levels of HIV-prevalence, there could be a large number of AIDS orphans who are under-educated. But this means that these orphans will not be able to afford an education for their children, so that the next generation will also be under-educated. This process can continue with the proportion of under-educated people rising with each successive generation. The result is that an economy with a moderately educated population before the onset of AIDS could in three or four generations end up with an uneducated population. And since economic growth is linked to the accumulation of human capital, this means that an otherwise growing economy could begin to slow down and eventually shrink..

Bell, Devarajan and Gersbach [2006] apply this framework to data from South Africa, a country with an HIV-positive population of about 25 percent. Using mortality data, they calculate that the proportion of double-orphans can rise from less than one percent in 1990 to almost 20 percent in 2010 (Table 1).

Table 1: South Africa: Probabilities

	Both alive	Father dead	Mother dead	Both dead
1990	0.855	0.101	0.039	0.005
2010 (forecast)	0.294	0.168	0.347	0.194

Source: Bell, Devarajan and Gersbach [2006], Dorrington et al. [2001]

Can such a sizeable increase in the proportion (and hence the number) of orphans trigger the vicious cycle described earlier, whereby each successive generation is less educated than its



predecessor? Using various parameter estimates, Bell, Devarajan and Gersbach calculate the critical level of human capital, λ^* . If the economy's average level of human capital is above λ^* , human capital will accumulate over time. But if it drops below λ^* , the economy's average level of human capital will decline (Figure 1). In the case of South Africa, while the initial (i.e. 1990) level was above λ^* , the impact of the AIDS shock (and its attendant effect on the education level of orphans) leads to λ falling below λ^* . The vicious cycle ensues, with human capital declining until the majority of the population is under-educated.

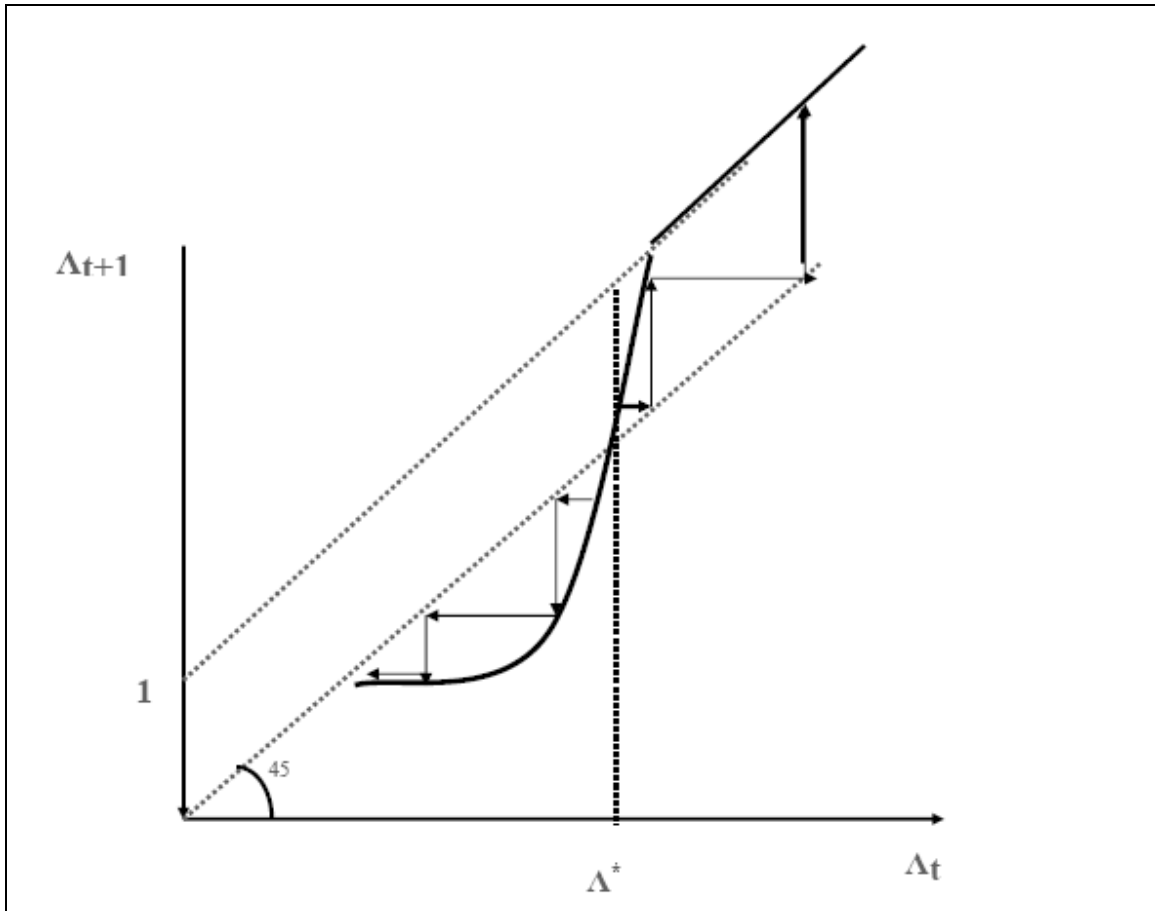


Figure 1: Human capital dynamics in Bell, Devarajan and Gersbach [2006]

The economic effect of this decline in human capital can be devastating (Table 2). Whereas in the “No AIDS” scenario, the economy would have enjoyed reasonably rapid growth, with average household income quadrupling in three generations, or 90 years, with AIDS and the associated decline in human capital, household incomes shrink to about half their 1990 levels. Note further that the level of household incomes in 1990 is higher with AIDS than without AIDS. How can this be? Quite simply, with AIDS, more households pull their children out of school and put them to work, thereby contributing to *current* income, but shortchanging future income because these children will not be educated.



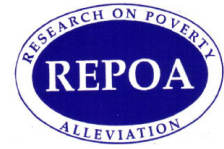
Table 2: The Economy with and without AIDS

year	No AIDS			AIDS		
	<i>Human capital</i>	<i>Education</i>	<i>Household income</i>	<i>Human capital</i>	<i>Education</i>	<i>Household income</i>
1960	2.62	0.50	19.5	2.62	0.5	19.5
1990	3.14	0.64	22.3	3.14	0.2	26.4
2020	4.32	0.97	29.6	2.01	0	17.8
2050	7.90	1.00	53.7	1.00	0	12.9
2080	13.85	1.00	94.7	1.00	0	12.9

Source: Bell, Devarajan and Gersbach [2006]

This last point reinforces the particularly insidious nature of HIV/AIDS. Its impact on the economy is felt only in the long-term, through the progressive under-education of AIDS orphans, generation after generation. This is also therefore the case for public action. By intervening early (before the impact of AIDS on growth can be detected), the government can prevent the downward spiral, and restore the economy to steady growth. How much intervention is necessary? Using a variety of estimates for the productivity of spending on education and health, Bell, Devarajan and Gersbach [2006] calculate that annual spending of about 4 percent of GDP would be approximately what it will take to avoid the collapse of this economy. Note that the interventions are not just in health, but also in education—in order to maintain the education level of AIDS orphans and avert the decline in human capital. Interventions in health, too, can be valuable. Prevention of AIDS will reduce the incidence of AIDS orphans in future. And treatment programs, by keeping HIV-positive parents alive longer, can have a beneficial effect on economic growth by enabling these people's children to go to school, and enjoy a longer life with their parents and hence benefit from their love, affection and life skills.

The Bell, Devarajan and Gersbach [2006] argument can be (and has been) criticized on several grounds. One set of critiques stem from the fact that these dramatic effects on economic growth have not been observed, even in Sub-Saharan Africa. Short-term forecasting models of the South African economy find the effect of AIDS on growth to be much milder (Bureau for Economic Research [2006]). But this criticism misses the point that BDG are describing a long-term effect, something which cannot be captured by short-term macroeconomic models. A second counterpoint

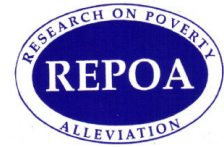


to BDG is Young's [2004] paper, which posits a negative relationship between HIV and fertility. The benefits of lower fertility outweigh the costs of neglected and abandoned children, leaving the economy better off. However, some recent empirical work by Kalem-Ozcan [2006] finds the reverse—a positive relationship between HIV and fertility—so Young's results may not hold.

A third line of criticism is that the Bell, Devarajan and Gersbach analysis is a simulation model based on several parameters, such as the impact of parental death on children's schooling and learning, that were "guesstimates" at best. This is a reasonable critique because the rather striking results of BDG (their sensitivity analysis notwithstanding) hinge on many of these parameters. However, recent empirical microeconomic work provides strong support to the qualitative effects and quantitative parameter estimates used in BDG.

First, a growing literature shows the negative impacts of parental mortality on child welfare. Using longitudinal data, results generally show strong educational effects in terms of delayed enrollment, reduced attendance and/or dropping out following the death of a parent, particularly mothers. One of the more in-depth of these studies is by Beegle, De Weerd and Dercon [2006]. They follow up on a 1991-1994 set of households in the Kagera region of Tanzania (an area with high AIDS-related mortality) and track all of the initial respondents, as well as split-off households. As they note, this gives us a rare insight into the effect of adult mortality since most studies take a given household (with or without orphans) as the starting point for analysis. As the follow-up survey was done in 2004, this also gives us a long-term view of the effect of adult mortality. They find that maternal mortality is associated with a significant, permanent school loss of around 1 full year on average (given the average number of years completed in this area, this is a sizable effect). They also find that maternal mortality is associated with height deficiencies. This would suggest that parental death is associated with some period of nutritional deprivation – a result that is also borne out in the literature on ARV treatment. To be sure, the evidence is more mixed in the cross country work (Ainsworth and Filmer [2006]). This work also tends to be cross-sectional in nature, which makes it harder to control for child or family unobservable characteristics.

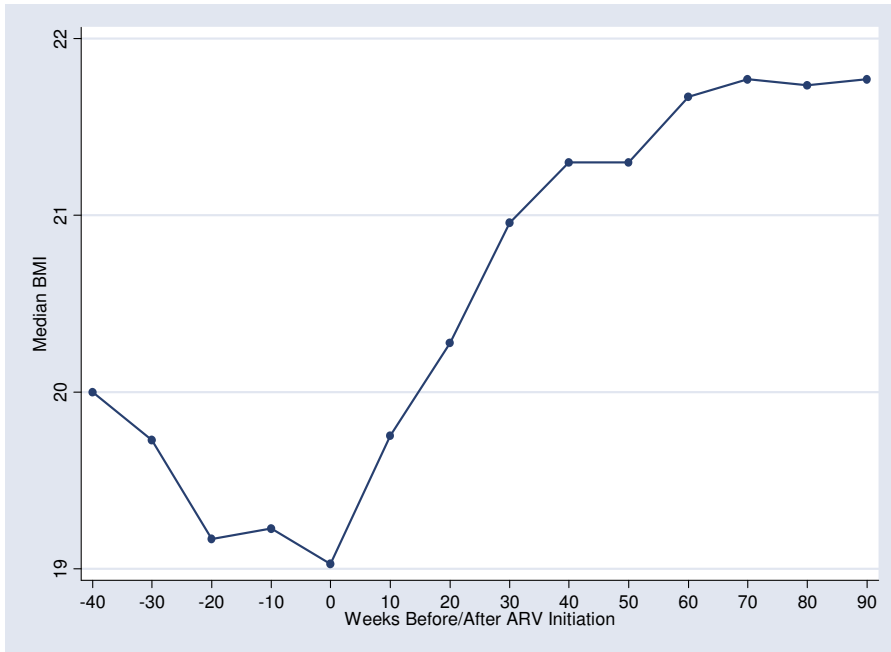
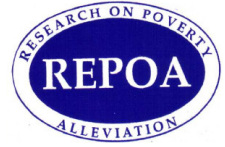
Secondly, some evidence seems to indicate that it is not simply the pecuniary loss associated with the parent's death that is responsible for all of the effects. In a study of orphans in Indonesia and Mexico, Gertler, et al. [2004] find that simply the presence of the parents seems to explain a large portion of the effects they observe (reduced child health and educational outcomes). Hence, keeping the parents alive delivers benefits in terms of education and health (let alone love and affection) that are going to be difficult, if not impossible, to redress through some sort of



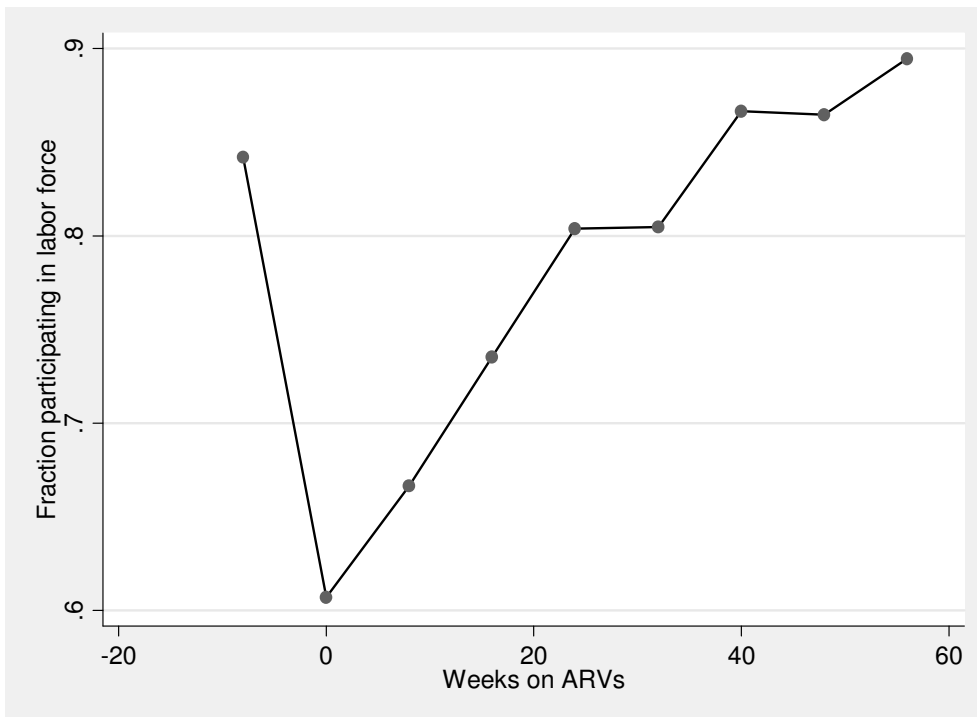
compensatory transfer. Furthermore, the evidence on orphans who are fostered shows that orphans tend to be treated worse than non-foster children in the same household, even when controlling for household income. For example, Case and Ardington [2006], using panel data for South Africa, show that maternal orphans are less likely to be enrolled and complete less school; they find orphans are worse off than other children in the household. As in Case, Paxson, and Ableidinger [2004], they argue that this fact points to the need for very careful targeting of any policy seeking to redress this. This policy would need to be targeted to the orphans directly – either through a transfer in kind (e.g. the provision of school uniforms or reduced fees) or in another fashion that would not allow it to be absorbed by the rest of the members of the household in which the orphan resides. This argument points to the imperative of avoiding anything that is remotely fungible, as it is clear that these orphans have a lower weight in the household utility function and hence any fungible transfer will have a low marginal effect on orphans. Taken together, these two points strengthen the case for keeping parents alive relative to providing post-parental death benefits to orphans.

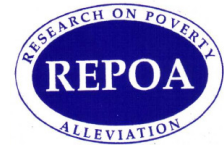
This last observation takes us to the question of what kinds of public actions should be used to address the efficiency and growth-retarding effects of AIDS orphans. The first issue is the relative merits of prevention v. treatment. While prevention programs can have a powerful effect on reducing the incidence of AIDS, and hence mitigating some of the long-term economic consequences described here, treatment programs (that do very little for the incidence of AIDS) could have a favorable effect on economic growth through their ability to keep parents alive longer, enabling their children to attend school and develop life skills.

We can separate the effects of keeping the parents alive into two main effects. The first effect is that ARV treatment has a very rapid labor response. This story is best told with 2 figures from Thirumurthy, Graff-Zivin and Goldstein [2005]. Figure 2, below, comes from patient medical records and shows what we know from the medical literature: that CD4 counts and other measures of health respond very rapidly once ARVs are initiated.



The second figure (which has a smaller range on the x-axis) covers the same set of patients, but uses household survey data to show the labor response for the same set of individuals:





As we can see from these graphs, once patients are treated, they make a very rapid return to the labor force. As Thirumurthy, Graff-Zivin and Goldstein [2005] show, patients experience a 20% increase in the likelihood of working and a 35% increase in hours worked within six months of initiating treatment. Other studies show similar effect: for example Habyarimana, Mbakile, and Pop-Eleches [2007] find that the labor supply of workers declines with the morbidity effects of HIV/AIDS, but increases again, to the point where attendance is no different from non-infected workers, when ARVs are provided.

While the literature that focuses on patients shows a large and significant income effect for the patient, we can also look at the effects of ARV treatment on other, non-infected individuals within the household. In terms of labor supply, Thirumurthy, Graff Zivin and Goldstein find [2005] that the increase in the patient labor supply is accompanied by shifts of labor within the household as women and young boys reduce their labor supply. In another paper (Graff Zivin, Thirumurthy and Goldstein, 2006), these authors look directly at the effect of treatment on the patients' children. They find that children's weekly school attendance increases by 20% within six months after the initiation of treatment. These effects are relative to the trend of children in a random sample of households in the same area – when the children of ARV patients are compared to orphans (arguably the likely outcome in the absence of treatment) the effect is much larger. The authors also find a sharp increase in child nutrition, with a more than 0.5 standard deviation increase in the weight for height z-score shortly after treatment is started. This increase in nutrition erases the gap that exists between the comparison (random sample) children and the ARV patient children at baseline. Putting these results together shows a very strong household socio-economic response to treatment: patient's income increases, children come out of the labor market, they go to school more and are better nourished.

For children who have already lost one or more of their parents to AIDS, education interventions targeted to AIDS orphans can have a powerful effect on reversing the trend of under-education. In fact, Bell, Devarajan and Gersbach [2006] show that targeted education subsidies could be a cost-effective instrument, since they address the problem at its source. Child welfare subsidies could also be effective, although the caution about asymmetric treatment between orphans and other children in the household should be taken into account here.

Attractive as they may be, these solutions have problems of their own. For instance, treatment programs require reasonably well-functioning health systems to be effective. Yet most of



the high-prevalence countries are in Africa or low-income Asia, both of which suffer from weak health systems. The point made here, however, is that the case for strengthening health systems in order to make HIV treatment effective is that much stronger if you consider the gains in economic growth from keeping HIV-positive parents alive longer. Similarly, the education systems of these countries are often poorly run and managed. A program of education subsidies, or even vouchers to AIDS orphans, may not increase learning if these schools remain dysfunctional. But one of the reasons the education system is so dysfunctional is the fact that the public system has failed to put in place accountability mechanisms that ensure that teachers show up to work, that students are taught and that learning occurs. In many countries, private schools have come up, often in poor areas, simply to fill this void. By targeting orphans with vouchers, for instance, the government is giving them a choice between private and public schools. It is possible that the ability of these orphans to vote with their feet will create incentives for all schools to improve the quality of service delivery, as they have in Bangladesh or Colombia (Gauri and Vadwa [2004]). Finally, there may be a concern that, if the additional assistance is financed with foreign aid, such a sizeable increase in aid will cause the real exchange rate to appreciate and undermine export competitiveness (Rajan and Subramanian [2006]). While there is some evidence of such effects in high-aid countries, these have to be weighed against the growth-promoting effects of this aid through the protection of human capital among AIDS orphans, their children, their grandchildren, and so on.

The theory of public economics provides two clear rationales for public action, namely, market failure and redistribution. In practice, it is difficult to find candidates for public intervention that fall cleanly into one of these categories. Correcting a market failure, for instance, can introduce “government failures” which might be worse than the original problem. Similarly, redistribution can sometimes have incentive effects that undermine efficiency. The case of AIDS orphans in high-prevalence countries, because of its potentially devastating effects on economic growth, provides a rare case where the argument for public action is irrefutable.



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