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Rethinking HIV/AIDS in South Africa: Has Response been Overmedicalized?

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Rethinking HIV/AIDS in South Africa: Has Response been Overmedicalized?

Laura M. Kelley & Nicholas Eberstadt*

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Comments welcome
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Abstract: This paper examines the potential impact of HIV/AIDS on different levels of South African society (individual, household, and national) over time. Using differences in demographic projections to guide the analysis, the prospective implications of HIV/AIDS on households, society, economy and nation are discussed and issues that could influence or mitigate those possible impacts are examined. We outline the challenges that South Africa will likely face due to the effects of its AIDS-related excess mortality and conclude that programs delivering a broader variety of services than are currently offered are needed for South Africa to emerge a prosperous, regional power by mid-century. Inadequacies of current HIV/AIDS relief programs are broadly considered and suggestions are offered for improvement. We argue that a fundamental shift in the focus of HIV/AIDS strategies to include consideration of the needs of the survivors of this pandemic, and the world they will live in, is urgently necessary.

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1.) Introduction

When laboratory scientists look at samples under the microscope, they use different eye-pieces to give them varying perspectives. The low power optic allows them to view entire populations of microorganisms, while a medium power magnification allows them to view just two or three cells at a time and a high-power optic lets them examine the internal structure of a single cell. To assess and address the great global health challenges that confront humanity today, governments and concerned citizens likewise need to use "lenses" of differing apertures to frame effective strategies for promoting human wellbeing. Unfortunately, recent experience suggests that we are not always as adept as laboratory technicians in choosing the right lenses for focusing on the big picture view of global health policies.

A general lack of a "big picture" focus can slant, and sometimes seriously distort, our analyses and responses: encouraging us to "overmedicalize" our approach to outbreaks and epidemics, while all too often leaving the ill, the uninfected and survivors without the social services and other arrangements they need to flourish rather than to simply survive.

This focus problem is all too apparent in our current expert assessments of the HIV/AIDS pandemic unfolding in South Africa. By any human measure, the situation is unquestionably a disaster, for no country on the planet has been so severely stricken by HIV/AIDS as South Africa. Current estimates suggest that the cumulative death toll from AIDS in that country is approaching 2 million victims and that another 5.7 million people in South Africa are living with HIV, with the number of these new infections yet to definitively level off. Yet much of what we have assumed to be true about the impact of the HIV/AIDS pandemic in South Africa remains skewed without a broader, more coherent, big picture view.

In the West, images of South Africans suffering with HIV/AIDS besiege us: parents dying horrible deaths beside their soon to be orphaned children and entire families buckling under the weight of the disease. We, the healthy and the comfortable in the rest of the world, feel a moral compunction to ease their pain. We shovel piles of money into programs like The Global Fund and PEPFAR designed to keep the ill alive a in the hopes of eventually finding a miracle cure for HIV. Our response is largely medical—"narrow focus"-- as we dole out medicines to prevent transmission from mother-to-child or to keep virus counts in individuals low. While we spend money, what we do not spend is much thought on the society and country that will be the home of HIV/AIDS survivors. This paper is an attempt partly to redress this imbalance, by examining a number of issues that can be expected to confront South Africa's surviving population in the decades immediately ahead.

2.) Impact of HIV/AIDS on Households and Families

The impact of HIV/AIDS in South Africa will vary significantly in both nature and magnitude depending upon whether the country is considered on individual, on community or on national levels and upon the time frame examined.

Using a high-power lens and projecting impacts across time, we can expect the suffering of individuals and households to continue very largely unabated through 2020-2025. Until all current epidemiological models predict that disease incidence should be firmly falling, massive numbers of South Africans will still be expected to suffer and die from HIV/AIDS despite current efforts to extend lives with medication. At the moment, UNAIDS estimates that somewhere between 270,000 and 450,000 South Africans are dying of AIDS each year, while the US Census Bureau estimates total annual death in South Africa at around 830,000 a year—meaning that AIDS is currently though to account for at least a third of all deaths in South Africa, and possibly more than half of the country's annual mortality.

Because HIV/AIDS is not a socially neutral virus, it will continue to do in South Africa what it has been doing for several decades: namely, infect and kill a far higher proportion of the poor and uneducated than of the wealthy, primarily because the poor are the last to hear or understand public health prevention messages. HIV/AIDS also kills the poor more quickly than it kills the wealthy because of differences in overall health and lack of access to medications and social support services. Not only does HIV/AIDS disproportionately infect the poor, HIV/AIDS also attacks specific genders and ethnicities: South Africa's blacks or "Africans" are infected and die up to 15 times more than their white neighbors, and women are infected and die more frequently than men. This heterogeneity of infection risk and diversity of human capital endowment is one of the key factors that helps explain the otherwise puzzling lack of macroeconomic impact of the epidemic in South Africa, given the country's extraordinarily high HIV/AIDS infection prevalence (currently estimated at nearly a fifth of the nation's 15-49 population).

A.) The Rift Widens: The poor get poorer as women and children swell the ranks

Without improved support and management by social services organizations, the deaths of millions of HIV-positive people may strain the social contract that South Africa is built upon. Regardless of the precise projected number of AIDS deaths, it will be a monumental challenge for South Africa to mitigate the consequences of this coming wave of excess mortality. As their illnesses worsen, many HIV/AIDS victims who can no longer work will sell personal and family possessions to pay bills. In the years immediately ahead—say, through

the years 2020 – 2025-- the gap between the comfortable and the destitute will inexorably grow more acute as more South Africans contract HIV, and ultimately die from AIDS. Paradoxically, while the rolls of the South Africa's working classes and middle class may well swell in the years ahead (as South African creates more skilled jobs) and the total numbers of rich South Africans may even increase (if slightly), more of the poor in South Africa are likely to be worse off than they are even today.

There is an additional tragic social wrinkle in South Africa to the inevitable individual disaster that contraction of HIV so commonly portends In many communities within black South Africa, tradition often dictates that upon the death of the father, ownership of the land returns to *his* family if he has no heirs of legal age; widows and orphaned children are may remain on the land only at the forbearance of their in-laws. This institutional scheme of ownership and inheritance often results in harrowing economic problems for rural black women widowed by HIV/AIDS, for they have little or no legal rights to the properties that they worked on for most of their adult lives. Especially in rural areas, this dilemma has worsened gender inequalities, as it strips women and children of their most valuable tangible assets – their land. Sometimes, it forces them to vacate their homes and sell their labor in any way they can just to survive. Many women and children move from rural areas to towns or cities in an attempt to find work and escape the more pervasive poverty that rules the countryside, thereby leaving many vulnerable to exploitation. It is all but certain that this unenviable fate awaits many more women and children of South Africa's rising generation.

B.) Nuclear Families on the Rise

A long-term trend toward urbanization and the breakup of families by poor health and disease may change the characteristic definition of what a "household" is in South Africa. With fully three-fifths of the country's population currently living in urban areas and the combined population of South Africa's nine largest cities increasing by an estimated 15% between 1996 and 2001 alone, there is evidence to suggest that families—and especially poorer families—are splintering into smaller and smaller groups and are spreading across cities and towns. The global trend towards the modern, "nuclear" family unit is well underway in South Africa as well, and is likely to continue as urbanization and HIV/AIDS-related deaths continue to rise. Rapid urbanization by itself places tremendous strain on the public services that may be available in cities and can be expected to spur the expansion of urban slums. By 2030, more than 70 percent of South Africans are expected to dwell in cities. Coupled with the trend towards the nuclear family, this presages a growing physical distance between erstwhile extended family groups—a geographic fact that may contribute to the breakdown of familial obligations of responsibility to vulnerable members and leave fewer adults to care for children and the elderly. Such changes pose special risks for South Africa's most vulner-

able group, its children: children in nuclear families are less likely to have relatives willing to care for them than in an extended one when one or both parents die.

In 2006, the Actuarial Society of South Africa predicted that the number of orphans from both deaths due to HIV/AIDS and non-HIV/AIDS should peak in South Africa between 2015 and 2020 at approximately 2.3 -2.5 million children. These projections suggest that by 2020, 6 percent of all South African citizens and 17-19 percent of all children under 15 could well be orphans.

So far, the burden of these orphans in South Africa is shared across social networks of extended families. There is evidence that, in a number of instances, such orphans have not been cared for as well as the caregivers' own children: a problem reinforced by the poverty of the families in question.

As extended families become smaller, the burden of caring for orphans has fallen to older women. Unlike in days past, when parents would migrate to find work and provide for the older women who cared for their children, today's elderly caregivers must support these second families themselves without much additional help.

Orphans in South Africa bear a double disadvantage: not only are they much more likely to come from and to be taken into poor families, but they also have fewer resources than children in the same economic circumstances who live with their biological parents. Research in sub-Saharan Africa points to the troubling prevalence of what biologists call "Hamilton's law"—the tendency for care of a child to relate directly in proportion with the familial distance between the child and the head of the child's new household. This phenomenon suggests that orphans in South Africa can expect to receive notably less education than other children from the same social background in other nations. Without intervention, this individual injustice, multiplied by millions of cases, will depress the education of the rising generation in South Africa.

3.). Impact of HIV/AIDS on South African Society

At the societal level, there is still a great deal of disagreement amongst demographers, epidemiologists and public health experts over just how much demographic impact HIV/AIDS will have on South Africa over the next several decades.

In the early years of the global AIDS pandemic, expert projections tended to underestimate the tempo at which the disease was spreading; more recently, the consensus has erred on the side of overestimating the march of the epidemic. Over the past several years, in fact, international estimates of both the current prevalence of HIV infections and the annual incidence

of new infections have been adjusted downwards, especially for sub-Saharan Africa. Indeed, there are some specialists who argue that the global HIV/AIDS pandemic may have crested already and that HIV situation will gradually improve in the years immediately ahead Given the limits of our ability to forecast the pandemic's path, such conjectures about the future must obviously be treated with caution. However, the toll of HIV/AIDS in the sub-Sahara—over 20 million people infected and up to 1.7 million per year dying from the disease—remains a catastrophe, irrespective of the disputes about of the epidemic's future course.

In 2008, the US Bureau of the Census published new international demographic projections which departed dramatically from previous projections for South Africa. Earlier projections by the Census Bureau estimated a 10 percent decline in population by 2025 and a 25 percent decline by 2050. By contrast, the new projections depict a less than 2 percent population decline beginning by about 2010, followed by a long, slow correction that restores population to the pre-2010 level by about 2035 (See Figure 1).

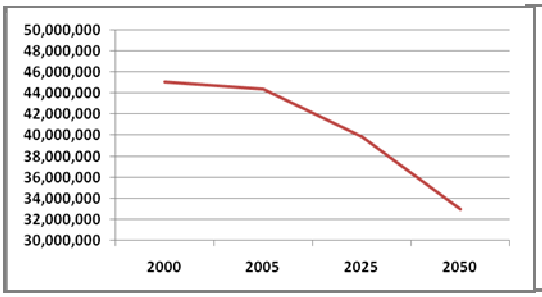
Overall, the new figures do not project a population decline in South Africa between now and 2050; rather, they approximate a 2.5 percent increase by 2025 and a 4 percent increase by 2050. The radical difference between these two projections clearly shows how fragile and changeable long-term demographic projections can be, and how they can be influenced by both new data and by what are in essence subjective factors like optimism and pessimism.

Without a doubt, data for the earlier set of projections were collected and analyzed during a time of pessimism about HIV/AIDS. In South Africa, it seemed like nothing could stop the proliferation of the virus and the atmosphere of death that pervaded society. As is all too well known, despite international pressure and criticism, South Africa's own government turned a blind eye to the suffering of its infected citizens for much of the post-Apartheid era

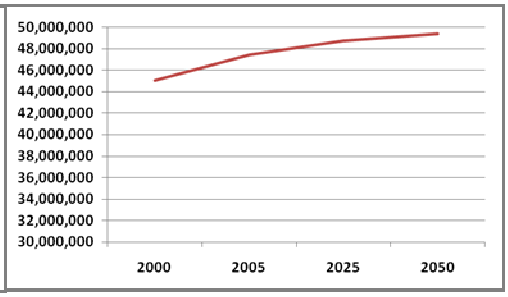
A.) The Man behind the Curtain: Changes in Fertility and Mortality Estimates

Estimations of trends in fertility, mortality, life expectancy, and migration are but a few of the types of information compiled, analyzed and assessed by the U.S. Bureau of the Census, the United Nations Population Division (UNPD), and other agencies generating demographic projections for South Africa.

Figure 1. Comparison of US Census Bureau Population Projections for South Africa, 2000-2050



Source: US Bureau of the Census, Int'l Database, 2002



Source: U.S. Bureau of the Census, Int'l Database, 2008

It is not the purpose of this section to criticize the procedures or the intent of those who made the estimates, but there are inconsistencies among the projections for South Africa that cannot be resolved even with a careful review of the data.

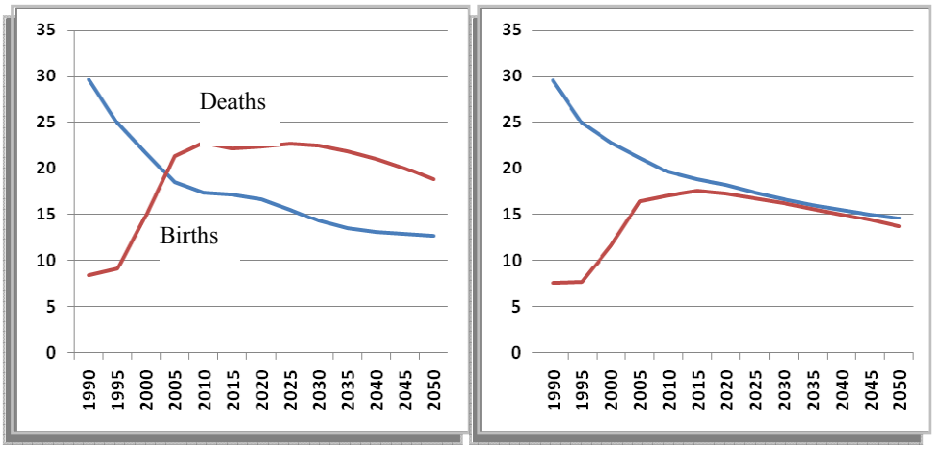
The future fertility trends envisioned in the two U.S. Bureau of the Census projections have changed – but not by very much (See Figure 2). The new projections depict a slower decline in fertility than in previous years, bringing the Census Bureau figures in closer agreement with those long used by UNPD, Statistics South Africa and the Actuarial Society of South Africa. Variation in fertility is very important to estimates and projections of long-term population trends because each person born contributes directly to the base population size, which in turn contributes to population momentum. Thus, small changes in fertility can have large effects on population structures and projections.

For the past few decades, fertility levels in South Africa have declined, as they have in most of the world. The lion's share of this decline is due to long-term trends of fertility reduction across ethnicities (fertility decline for whites began in the 19th Century, for Asians in the 1950s, and for Coloreds—those of mixed white/black/Asian background—and Blacks (Africans), the decline began in the mid- 1960s). However, the dramatic total fertility rate (TFR) decline in Africans from 4.6 to 3.1 children per woman between 1987-1998 is not only attributable to changing political and economic circumstances that the end of Apartheid brought, but also to the proximate impact of HIV/AIDS.

HIV/AIDS is well known to bring about decreases in fertility through reductions in the ability to bear live and healthy young and in women's choices not to bear children they may not live to raise.

Analysis of the South African Census estimated total fertility rate (TFR) of 2.84 to 3.0 for 2001 (the year of the most recent census in South Africa), and in 2004 Statistics South Africa estimated a TFR of 2.77. (South Africa's next census is planned for 2011.) The new U.S. Census Bureau estimates the current TFR to be around 2.4 in 2008, and projects it will steadily decline to roughly replacement levels (an average of 2.1 children born per woman of reproductive age) by 2022.

Figure 2. Comparison of Fertility and Mortality Projections for South Africa, 2000-2050



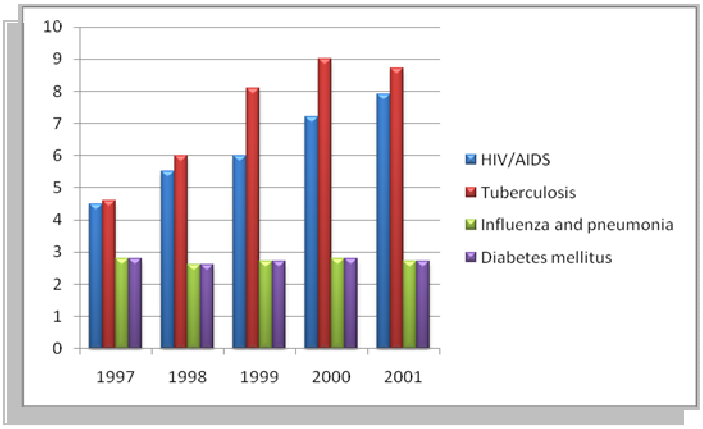
Source: US Bureau of the Census, Int'l Database, 2002

Source: US Bureau of the Census, Int'l Database, 2008

Although the changes in fertility projections are fairly modest between the two data sets, the changes in mortality projections are, on the other hand, quite profound: with mortality per thousand people falling by just over one-quarter between old and new projections for the year 2010 alone (from almost 23 to around 17). (See Figure 2). Furthermore, the shape of the mortality projection curves varies significantly. The earlier releases projected a high and fairly steady mortality rate of over 20 per 1,000 from 2005 to about 2045 while the newer revision shows mortality peaking at around 17.6 per 1,000 in 2015 and then declining continuously to under 14 per 1,000 by 2050. At no point do deaths exceed births in the new projections, although they did so in 2002-2003 in the earlier work, which suggested deaths in South Africa would exceed births thereafter until at least mid-century.

This change in the two Census Bureau datasets significantly alters estimates of the population structure of South Africa in coming decades. Of course, there are other causes of mortality in South Africa, but HIV/AIDS and related diseases (i.e. tuberculosis) are by far the most common single cause of death. Vital statistics from South Africa itself demonstrate that deaths from AIDS and TB (typically, a co-factor in HIV/AIDS morbidity) have risen precipitously into the current decade (See Figure 3). Since prevention of the spread of the virus in South Africa remains problematic and a cure is nowhere in sight, the new mortality projections owe a great deal —possibly too much—to hopes born of the expansion of the recently introduced antiretroviral medication programs.

Figure 3. Levels of HIV-Related Causes of Death in South African Adults 1997-2001 (in percent)

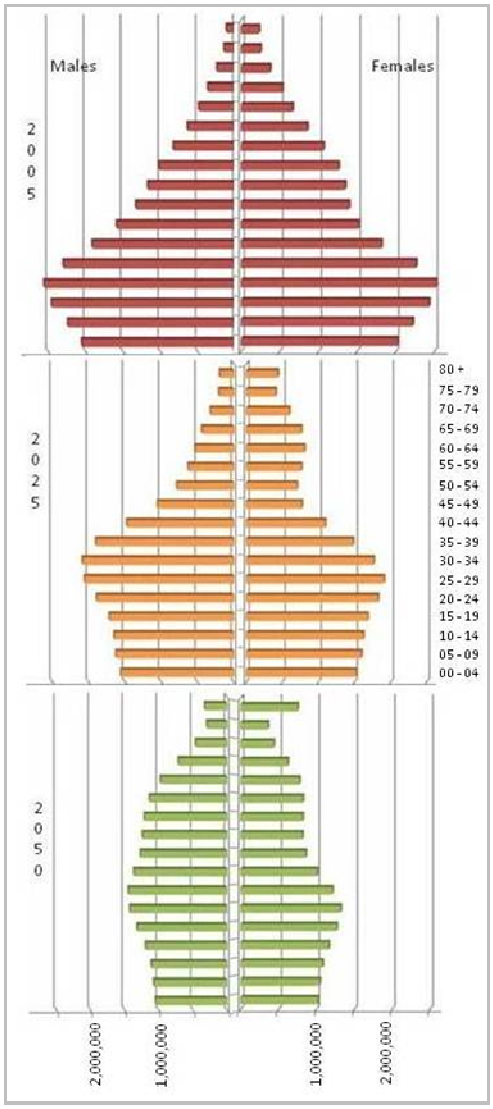


Source: Statistics South Africa

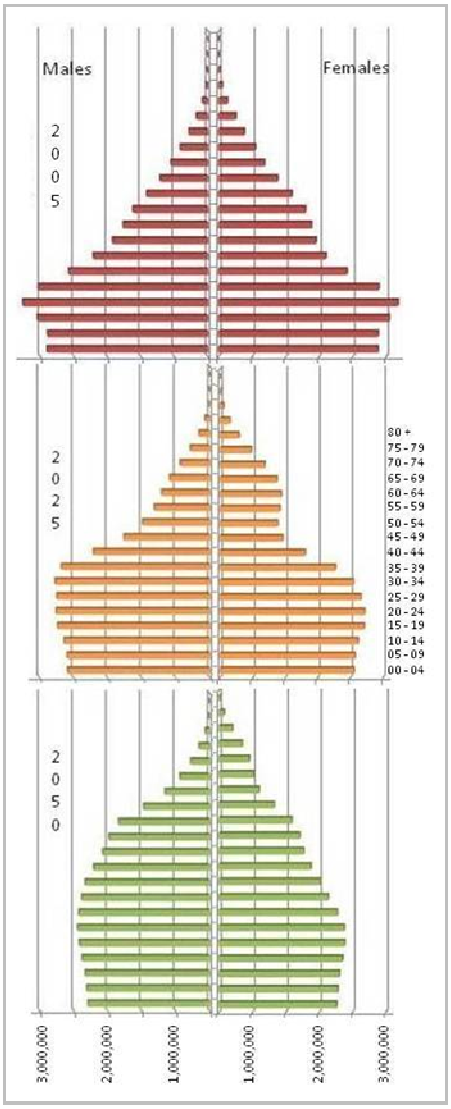
According to UNAIDS, there were about 325,000 people in South Africa on antiretroviral therapy in 2006. Additionally, in 2007, WHO estimated that that the life-extending therapy was reaching 428,000 South Africans. Even if such a fabulous program rollout rate (more than 100,000 new treatment enrollees in a single year) can be sustained over time, it will not keep pace with what most experts believe is a still-growing trajectory of infection, and most of the people currently awaiting treatment will die long before treatment begins. Recent estimates indicate there are still more than a million people with severe disease who need treatment urgently and another 4.3 million with diagnosed infections who will someday need treatment. Although it is unknown how widespread and long-term these medication programs in South Africa will become in future years – many programs are already severely constrained by lack of trained staff to oversee the programs - it may seem unduly optimistic to hang demographic projections on medication programs that now cover less than a third of those in need of the drugs.

Although it is probably still impossible to say which of the Census Bureau population projections are "right" or "wrong," it is possible to say that they predict two different futures for South Africa. For example, the 2008 projections paint a considerably more optimistic

Figure 4. Comparison of the Population Structure in South Africa, 2005, 2025 and 2050



Source: US Bureau of the Census, Int'l Database, 2002



Source: US Bureau of the Census, Int'l Database, 2008

future for individuals and households than do those of 2002. This contrast is primarily attributable to the fact that the newer projections leave millions of adults alive and able to care for, educate, and socialize children. Instead of millions of households disrupted by the death of a parent, as suggested by the 2002 projections, the 2008 figures indicate the number of families destroyed by HIV/AIDS will be dramatically lowered.

The population structures implied in the two Census Bureau data sets also reveal differences between the two projections. As seen in Figure 4, in addition to the new projections depicting modest increases in total population by 2.6 percent in 2025 and 4 percent in 2050; the new projections also depicts substantial and important differences for key age-groups in South Africa's from previous datasets, where profound declines of 10 to 25 percent were common.

For example, the 2002 Census Bureau figures envisioned a decline in reproductive age females (women between the ages of 15 and 44) between 2005 and 2050 of 33 percent, while projections from 2008 anticipated a more modest 7 percent decrease over the same time period. Another major difference is in the projected population of working age (defined here as the 15-54 group) whereas the former projected a 30 percent decrease between 2005 and 2050 here (from over 26 million persons 05 to approximately 18 million) (See Figure 5); the newer data predicts a stable working-age population for South Africa between 2005 and 2050.

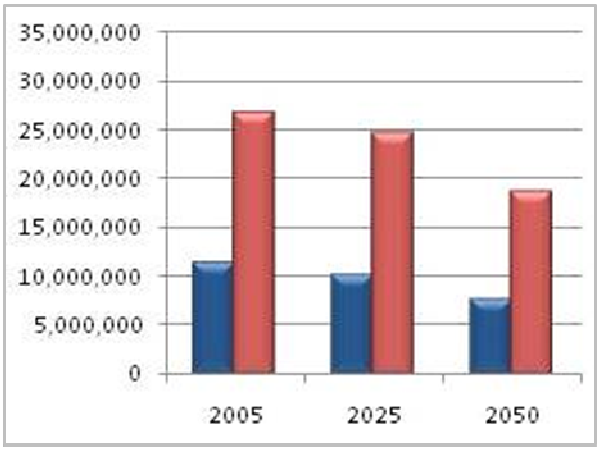
These two projections begin to paint strikingly different pictures of demographic change for South African society between 2005 and 2050. The 2002 figures would suggest populations of reproductive women and working adults rapidly declining–due to the ravages of HIV/AIDS, while the newer data depicts relatively stable populations of childbearing women and the prospective workers needed to drive the engine of Africa's economy. (See Figure 5).

Other differences in the 2002 and 2008 Census projections are evident when examining the number of elderly individuals ages 65+ who survive HIV/AIDS. The 2002 data indicated small prospective increases in the numbers of elderly between 2005 and 2025, and between 2025 and 2050. The more recent projections, on the other hand, envision a cumulative 120 percent increase in South Africa's elderly population over that same period (over 80% growth between 2005 and 2025, and a further 20% rise between 2025 and 2050). From the standpoint of responding to South Africa's HIV/AIDS epidemic, the implications of these divergent projections are enormous: some portion of healthy elderly will help care for orphaned children, but those who fall ill themselves and require additional care will place a

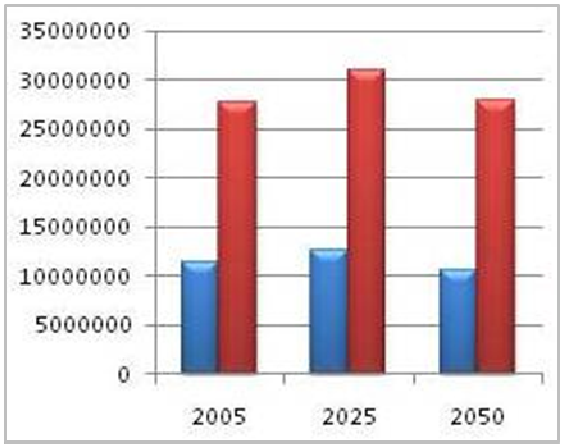
greater burden on families already coping with the deaths of their breadwinners from HIV/AIDS.

Both the 2002 and 2008 projections show decades of higher excess mortality for women relative to men, thereby ushering in an increasingly severe sex imbalance after 2025 (See Figures 4 and 5). The 2002 data suggest that this imbalance may be as high as 6-8 million, while the 2008 data suggest that the men will outnumber women by "only" a few million people. Either way, the phenomenon of "missing women" looks to be part of the South African future—indeed, it is already part of the South African present, today. (In some provinces, like Gauteng, this trend is already obvious.)

Figure 5. Comparison of Reproductive Women and Working Adults 2005-2050



Source: US Bureau of the Census, Int'l Database, 2002



Source: US Bureau of the Census, Int'l Database, 2008

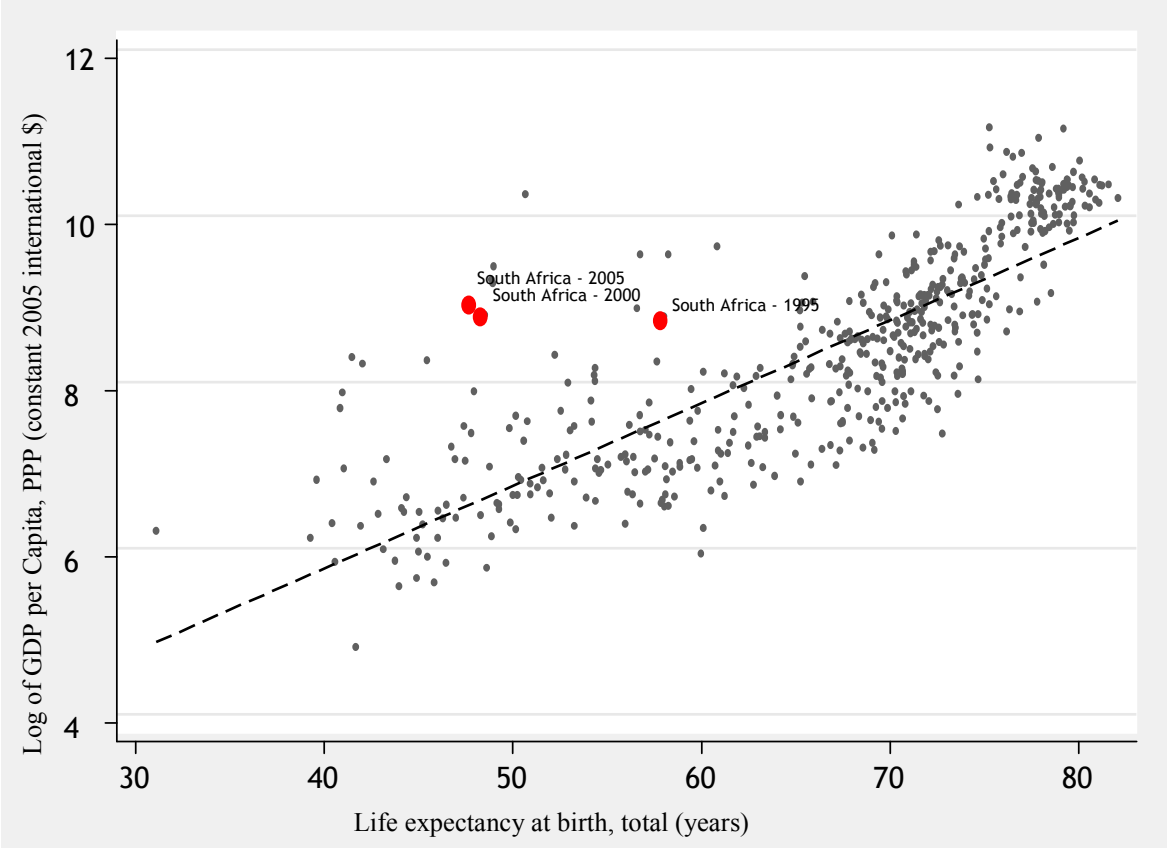
4.) Impact of HIV/AIDS at the National Level

At the macro or national level, the impact of HIV/AIDS and its concomitant demographic changes may be look surprisingly quite different from those at the individual and household level. By an ironic twist of fate, South Africa's post-apartheid HIV explosion has coincided with one of its best periods of overall economic performance in decades. This strange conjunction of mass death and continuing economic growth needs to be recognized and understood for what it portends.

Over the past two centuries, the worldwide story of modern economic growth is absolutely unambiguous: the cultivation of human resources—not natural resources—has been the

primary driver of increases in productivity and prosperity. In the early 2000s, before the global downturn, severe health reversals and accelerating economic growth challenge this storyline. In fact, as may be seen in Figure 6, South Africa has emerged an increasingly aberrant "outlier" from the overall global relationship between levels of national health and corresponding national levels of per capita GDP (after PPP adjustments).

Figure 6: Life expectancy at birth vs. GDP per capita PPP 1995, 2000 and 2005: South Africa in International Perspective



Source: World Bank World Development Indicators 2008, CD-ROM

For the world as a whole, to go by World Bank estimates from the *World Development Indicators* database, life expectancy at birth for males and females combined was a fairly powerful predictor of a country's per capita GDP. Indeed: variations between countries in life expectancy during this period corresponded with over two-thirds of the inter-country variation in output levels. Moreover, improvements in life expectancy were strongly and positively asso-

ciated with output levels on a worldwide basis: each additional year of life expectancy at birth corresponded with an inter-country increase in per capita GDP of nearly 10%.

Between 1995 and 2005, however, South Africa' health-to-income relationship veered ever further away from internationally-predicted patterns. In fact, they confuted the general relationship evident in the rest of the modern world. Between 1995 and 2005, by World Bank estimates, South Africa's life expectancy at birth fell by slightly over a decade—yet per capita GDP rose by over 15! By 2005, indeed, South Africa's level of GDP per capita was over 10 times as high as would have been predicted on the basis of life expectancy alone; put another way, the country's level of life expectancy was over two decades lower than would have been predicted simply on the basis of per capita income levels.

Some OPEC countries and societies heavily dependent on export of raw materials, it is true, do deviate far from the health-income trendline traced out in Figure 6, but South Africa's astonishing divergence from global patterns cannot be explained as a "resource economy" exception, since over half of the country's exports are accounted for by manufactured products. Moreover, South Africa's level of per capita output was improving precisely at the time that the country's overall level of life expectancy at birth seemed to be plummeting.

Surely this paradox deserves more extended examination. For now, however, we note that the extremely high levels of economic inequality and health heterogeneity evident in South Africa today and quite possibly still increasing due to the disproportionate impact of HIV on the poorest elements of South African society may help to explain the paradox. Even before the HIV/AIDS epidemic, South Africa was a country characterized by extraordinary disparities in health status by "race" or ethnicity: these disparities corresponded with differences in productive potential (although actual disparities in income and output may have been further accentuated by the race-based economic discrimination that was the essence of the Apartheid system.) If HIV/AIDS is disproportionately devastating the segment of South African society whose productivity levels were the very lowest to begin with (namely, rural Africans), while human capital endowments and attendant productivity potential of the healthiest and most educated strata of the country (most especially including urban Whites) continued to improve, the mystery of deteriorating national levels of life expectancy at birth in the face of improving national macroeconomic performance might in part be answered, at least in an arithmetic sense.

Economic history may also help provide clues, or at least analogies. It may be worth noting that heightened mortality levels have coincided with surges of economic output in industrialized economies in the past: most memorably, in the case of the major combatant powers during the Second World War. World War II, however, was temporary exertion, whereas South Africa has been in the grip of the HIV epidemic for two decades. Is this the current South African economic experience an extended example of modern economies faring un-

expectedly well during wars and disasters? Or does it demand a fundamental rethinking of modern development?

Since the late 1990s, South Africa's annual growth rate has averaged a bit over 3 percent per year, and this pace has been accelerating over time. During the early 2000s, the South African economy began to grow at approximately 4 - 5 percent per year.

Admittedly, the tempo of GDP growth at 4 - 5 percent per year did not come close to the rates in China, India, Russia, or "emerging markets" in which even double-digit annual growth rates were not extraordinary (at least before the current global financial crisis). However, in the sub-Saharan region where economic performance has been dismal since the 1970s, South Africa's post-apartheid economic record looks good.

Despite the 2008-2009 global economic downturn, South Africa seems poised to continue growing after it recovers from its recent recession and downturn in its mining sector. President Zuma's recent moves to lower interest rates and restructure the Cabinet should contribute to the recovery. Importantly, the reshuffling of the Cabinet moved the former finance minister Trevor Manuel—the architect of South Africa's post-apartheid economic resurgence—to head of a new national planning commission in the President's Office. Pravin Gordhan, the former head of the South African Revenue Commission, replaced Manuel.

South Africa's surprising macroeconomic showing after dismantling the apartheid-era economic system can be explained in terms of somewhat related factors, all associated with "orthodox" macroeconomic policy: disciplined and fairly conservative macroeconomic management by post-apartheid governments; major increases in foreign direct investment (FDI) due to increased foreign confidence in South Africa; promotion of trade openness; and the end of apartheid-era international economic sanctions. What has *not* figured significantly in this growth story, however, is any upsurge in human resource utilization. Quite the contrary is true: South Africa reports an astonishing unemployment rate of 25%, down from 30% around the turn of the century but nearly twice as high as at the end of apartheid. And there is the catastrophe of HIV, which infects perhaps one-fifth or one-sixth of the adult working population which has lowered the country's life expectancy at birth by a decade and a half or more since the end of apartheid.

Teasing out the details behind this growth, one finds years of sound monetary policy that has kept inflation stable and short-term interest rates low. Additionally, good fiscal management has allowed for low deficits and respectable debt servicing. Pretoria has sought to privatize portions of its telecommunications, energy and other industrial holdings, and, after years of stalled negotiations, it began to make good progress in this initiative in the early 2000s. As a result, the government now can increase its portion of development spending, and several large international houses have raised South Africa's credit rating, thereby allowing long-

stalled foreign direct investments (FDI) to pour into the country. Before the recent recession, many of the country's former sleepy coastal towns became hotbeds of economic activity as major international companies expand existing buildings or built plants nearby. Despite gloomy predictions of how high HIV/AIDS prevalence will slow or even derail economic growth at the national level, South Africa is poised to continue growing after recovering from its recent recession.

The two Census Bureau demographic projections used to discuss the impact of HIV/AIDS on communities can also help in assessing two varying futures for South Africa at the national level. Census 2002's projections, with high HIV/AIDS-related mortality, would have eased the future burden on the government for job creation and continued FDI stimulation and development spending. With this set of projections, good economic management and growth would have been coupled with high mortality to decrease unemployment rates and would have placed more low-skilled South Africans working in the country's new diversified economy.

If one considers the more positive projections from 2008 of HIV/AID's lower demographic impact, the pressure on the government to continue its sound fiscal management and macroeconomic policies will be extreme. Poverty alleviation could progress at a much slower pace than the 2002 projections depicted, especially if there is a shortfall in the creation of jobs. If, on the other hand, sustained trends in investment and job creation are coupled with a "worst case," high demographic impact of HIV/AIDS, as depicted by the 2002 Census projections, poverty alleviation and GDP growth may paradoxically be stronger as a rapidly dwindling number of workers encounters an increasing number of jobs.

Alwyn Young of the London School of Economics has indeed made the contrarian case that higher HIV mortality could potentially facilitate economic growth in a country like South Africa in the decades ahead: in his exposition, lower fertility levels and the resulting reduced "dependency ratios" could have beneficial economic effects that outweigh the obvious adverse implications of high mortality , increased socioeconomic disparities and depressed levels of educational attainment, a "gift of the dying" that would increase national savings rates and thus potentially investment and growth. Such a highly counter-intuitive argument would seem to contradict much or most of what modern economic research has seemingly established about the relationship between death and development. Given how little we evidently understand about the complex relationship today between macro-economic performance and the HIV/AIDS epidemic in South Africa, at least some measure of intellectual humility and openness is in order in the face of such contrarian challenges to received economic wisdom.

If the high demographic impact projection prevails, there will be increasingly severe shortages of skilled workers that may cause interruptions in service delivery. Deaths from AIDS

and emigration for better salaries or working conditions have already caused shortfalls in skilled professions, such as teachers, healthcare workers and engineers. Without intervention, the labor crunch in skilled professions is expected to increase as AIDS continues to take its toll. By 2010, for example, some estimates made in 2005 suggested that one in four teachers in KwaZulu Natal will be infected with HIV/AIDS. If no plans are made to stop the shortfall of teachers, it is possible that classes may be cancelled or schools closed as more teachers become too ill to work and then die as we approach 2020 and 2025. Other types of skilled labor requiring years of advanced training, such as healthcare workers and engineers, may have to be purchased for premium rates on a global market. Uninfected skilled laborers, on the other hand, may find their services in high demand and may be able to negotiate high wages and good benefits and consequently increasing their social mobility.

With the high-impact scenario, companies relying on skilled and semi-skilled labor may increasingly find themselves in the HIV/AIDS prevention and treatment business as well. Protecting their workers and their families from AIDS makes good business sense. Private delivery of these services has come to be known as the "AIDS tax" and will increasingly be the price of doing business in South Africa and other countries impacted by the disease. Over the next decade or two as AIDS worsens, smaller companies with skilled labor bases may find the cost of the AIDS tax too high. This may lead to mergers and the domination of the skilled labor market by medium and larger companies who can more easily absorb the costs of prevention and healthcare.

Another reason why high HIV/AIDS prevalence has not hurt growth in South Africa is that until only a couple of years ago, the government did little to help the growing number of its citizens suffering from HIV/AIDS-related illnesses. Whether their long inaction in the face of international criticism was a conscious choice on the part of the government to "save the forest by losing some trees" or whether it was a result of low prioritization of human health and welfare on Pretoria's to-do list, the spread of HIV/AIDS in South Africa will result in the deaths of millions of people. Many of these individuals would have been unskilled or semi-skilled laborers or amongst the long-term unemployed. The government's neglect of its people's health over the decades also saved the treasury billions dollars that was spent elsewhere. Whatever Pretoria's reasons, sound policies and diversification of its industry coupled with high excess mortality from AIDS-related illnesses and plummeting birth rates will lift the yoke of poverty from the shoulders of the underclass more quickly than good economic management alone.

The South African economy began to grow well at the same time that it was faced with mass excess mortality from HIV/AIDS, TB and related diseases. If the country's economy continues to be managed wisely, a smaller, more prosperous South Africa may emerge by 2050—ironically, possibly even shaped by those who died from HIV/AIDS and related diseases. In South Africa, taking the long view allows us to envision a different impact for the

disease. At the national level, the ill-wind of HIV/AIDS may draw necessary attention to change, but this change will not happen of its own accord; only planning and careful management will see the country through to a successful end.

5.) Managing Change In The Face Of the HIV/AIDS Epidemic

None of the prospective impacts described above are inevitable. Each one has some probability associated with it. Even the most ostensibly predictable of these many impacts – South Africa's unfolding demographic trends – demonstrate great variance between projections, and can be further altered in the years ahead by unforeseen or unforeseeable events. For example, an outbreak of drug-resistant tuberculosis (XDR-TB) could cause a terrible surge in deaths in HIV/AIDS infected people, increasing total predicted mortality from the disease significantly. Conversely, although considerably less likely, a research breakthrough might lead to a licensable treatment for HIV/AIDS before 2025 that would all but erase mortality from the disease.

What is important to remember here is that it will be possible to mitigate many of the adverse consequences that have been set in motion in South Africa's HIV/AIDS tragedy by anticipating and managing the changes wrought by HIV/AIDS morbidity and mortality. To accomplish this, however, impacts at different levels (individual, household, societal and national) must be considered.

A.) Rethinking Medication Delivery Programs

To begin: it may be necessary to commence a fundamental re-think about the ways that some of the resources of international funded HIV/AIDS relief programs with medication provision are allocated. Consider, for example, what are today the "showpiece" success stories of HIV/AIDS interventions in South Africa and the rest of the sub-Sahara: mother-to-child treatment programs. (MTCT). These efforts counsel HIV-positive women about the risks of transmitting the infection to their fetus, and as birth approaches medications are administered to dramatically decrease the chances of the infant emerging infected. The programs are cheap, easy to deliver, and—not least importantly—highly effective in saving the lives of infants and newborns who would otherwise be doomed to a life with HIV. But many donors are apparently unaware of what often happens to young children saved by these programs. The children, faced with the gruesome spectacle of watching their mothers die while they live on, often become progressively withdrawn and sick before her death. Those children fall outside of the medical services establishment completely when they are sent to live with relatives or, if old enough, when they attempt to live independently. Thus,

ironically, all too many of the children saved by MTCT programs experience a slow death sentence brought about by unintentional neglect as their mothers sicken and die. Motherhood, apple pie and saving babies aside: if we are to continue funding these MTCT programs, we must also consider increasing the social support requirements for the surviving children or else we must recognize that the practical consequence of our overmedicalized intervention programs here are to create armies of orphans, albeit inadvertently and with the best of intentions.

In South Africa today, the role of caring for orphans outside of extended families falls exclusively on non-governmental organizations and religious charities. Some civil-sector programs do provide for orphan care in their budgets, but the funds and human resources of these organizations are still limited, and their services only reach a small fraction of the children in need. Throughout Southern Africa, this unnecessary tragedy unfolds as many children whose lives were saved by MTCT programs slowly wither away emotionally as their mothers sicken and die. Because extended families are fragmenting, the burden of orphan care is falling harder on fewer and older relatives who can count on little in the way of external financial support. Some caregivers qualify for government subsidies but are unwilling or unable to complete the administrative "paper-chase" needed to collect the funds.

More broadly, we need to be rethinking the ways in which we allocate the expensive, life-extending medications consuming the bulk of international funding for HIV/AIDS. Our current allocation strategy rests on the belief that there is an adequate amount of money and international commitment to provide treatment for everyone who needs it and by extension posits the existence of a finite number of people needing treatment. Neither of these assumptions is correct, and as the number of infected soars globally, so does the amount of money needed to provide medication. Currently, physicians allocate most drugs on a first-come, first-served basis and with the most severely ill routed towards treatment. Medical personnel educate less ill individuals on how to care for themselves and treat patients for other health conditions but do not administer drugs to slow the inevitable immune collapse caused by HIV. Since the total number infected with HIV is still rising, an approach that allocates treatment to the sickest without thought to the roles they play in society may not be the strategy that best minimizes the future social, political and economic impact of the disease. Simply put, we treat individuals and *assume* it is also best for society. Although it may be politically infeasible and ethically indefensible to distribute treatment by criteria other than stage of infection (for instance by profession or by the need to provide for dependents), we must realize what the societal consequences may be of limiting allocation options.

Like it or not, the cruel fact of the matter is that South Africa is in the midst of a massive triage operation. The success of this triage operation, like any other, depends upon the awareness and concern of policymakers and stakeholders in recognize the nature and implications

of this process—and of avoiding the adverse and self-defeating consequences that the selection process intrinsic to triage can itself engender.

Over the past several years, the work of thousands of dedicated individuals has provided antiretroviral drug access to several million people worldwide. Although this is indeed a great achievement, the life-extending drugs have only been delivered to a fraction of the people who need them. There are already signs of donor fatigue—and as yet nowhere near enough trained healthcare workers to mount regional and national programs.

Additionally, there are growing protests within the international public health community about HIV/AIDS medication delivery programs poaching human and monetary resources from their own public health interventions (such as cost-effective community-based service delivery programs for infectious disease and maternal and child health). Is it ethically defensible to arrogate funding for ART when more lives are endangered by other infectious diseases and can be saved for a fraction of the cost per patient?

Rethinking our international and national approaches to medication delivery will force us to ask some very tough questions. For example: if there is only enough in the way of money and resources to provide drugs for, say, ten million people, we must make the difficult choice about which ten million will receive them. Should drugs be allocated to working adults between the ages of 15 and 49? Do people with dependent children deserve priority over people without children, or should medications and treatment be allocated proportionately according to the value of jobs performed in society (i.e., some economic productivity metric)? These are difficult—indeed, awful-- choices that force decision makers into morally murky waters. But to decide not to make these decisions is in itself a decision: one that may be responsible someday closing schools and hospitals for lack of teachers and nurses. As with all good policy, possible outcomes need to be considered before decisions are made. Yet in the rush to "do something" about HIV/AIDS, potential inadvertent outcomes of today's medication-delivery programs have as yet largely been overlooked or ignored.

To date, most of the world's resources to combat HIV/AIDS has been allocated towards minimizing the progress of the disease in those already infected and to a much lesser extent to prevent it in those yet to be infected. Now HIV policy and programs must expand its horizons to consider the needs of those who are and will remain uninfected. To put it bluntly, we must begin to design programs as if *the survivors* mattered too.

B.) Mitigating Impact at the Household Level

There is no way to mitigate completely the suffering that HIV/AIDS causes at the household level. Societal programs—in South Africa, but not only there--cannot placate children

watching parents slowly die or redress other lives uprooted shattered because these problems are simply too pervasive, and their human costs are so horrendous in scale. . It is difficult to describe the ghoulish, circus-like atmosphere of Durban's Umbilo Road mortuary district to someone who has never witnessed it: dozens upon dozens of coffin salesmen stand outside stores hawking their wares and promising better services and prices than the merchant 10 feet further on. "The people are dying" is a phrase heard throughout South Africa when speaking of the mortality caused by HIV/AIDS, but business is booming at the store *Coffins Galore*.

Some feasible policy changes may ease the pain of the survivors. A simple program, for example, would be to provide easier access to subsidies for those caring for orphaned children. This change would provide an improved quality of life for the child and make the status of the orphan more equal to that of his [adoptive?] brothers and sisters. Subsides and waived fees for school tuition and money for uniforms and books would make it easier for caregivers to keep orphans in school and ensure they are literate and numerate enough to hold manufacturing or service-sector jobs when they come of age.

Sweeping changes should surely be in order for South African inheritance laws: to allow women and underage children to stay in their homes when the man of the household dies. But such changes would challenge long-held traditions and customs. They would probably be widely unpopular in rural areas—and thus surprisingly unlikely to be implemented. An alternative could be to provide legal and social assistance to uprooted women in need. Resettlement assistance for widows or help in finding work could be parts of the program.

When no relatives are alive to care for dependent children, programs for placing children in subsidized foster care or adoptive homes would look to be more effective than group home or orphanage settings. Short-term counseling for psychological stress or religious counseling by clergy would surely help the bereaved mothers and children living at the fringes of someone else's hearth. The needs here loom large, and mounting social programs for large groups is such enormous task, but these survivors of the AIDS disaster are in need of this kind of help—not just more medication to treat HIV/AIDS.

C.) Mitigating Societal and National-Level Impacts

This rift that separates the rich and the poor, in South Africa as well as every other contemporary country, is a societal issue as well as an individual and familial one. As AIDS-related poverty deepens in South Africa, crime may rise as desperate people try to survive. Some of this crime may also have a racial component. But if whites increasingly perceive themselves as targets of robberies or violent crime in multiethnic, pluralistic South Africa, it is primarily because they hold most of the country's wealth. Other types of violence may also rise as

people psychologically respond to high levels of HIV/AIDS mortality. The national rates of murder and violence have always been acutely high in modern South Africa. Homicide as a cause of death is nearly 200 per 100,000 for working age men in South Africa and has risen more than 13 percent for men ages 20-24 from 1997 to 2004. Conversely, homicide as a cause of death for women is comparatively low at under 25 per 100,000 for working women of all ages but has alarmingly increased over 21 percent from 1997 to 2004 for women ages 20-24. It is difficult to assess whether these two sets of data actually represent sustained increases in homicide rates for these age cohorts or whether the next survey will indicate a downward trend in violence. However, careful monitoring of crime statistics and the ability and willingness of the government to increase policing at the signs of sustained increases in robberies and violent crime will keep the law functioning in South Africa.

The skilled labor shortage promises to be another hurdle for South African society will have to clear for its healthcare, educational and industrial bases to remain strong. Preparing now for the impending shortages of workers will help lessen the impact of high mortality in these professions. Without foresight and deliberate management, healthcare systems throughout the country already buckling under the strain of high HIV/AIDS caseloads may fail altogether if more attention is not paid to HIV-infected workers and those fleeing the country for better salaries or working conditions. With such management, "purchasing" (contract hiring) of healthcare workers on the regional or international markets for premium prices will ease the healthcare crunch in South Africa. Likewise, the creation of hierarchical case management networks that expand the duties of nurses and physician assistants would allow skilled workers to care for a larger number of patients even if reducing or eliminating time spent with them. Technological solutions include regional or national guidelines for disease management or even the use of distance diagnosis and care recommendations.

Without advance management, classrooms will become overcrowded, and schools will close as teachers continue to die from HIV/AIDS. With the necessary advance management, changes in the credentials required for teaching and the creation of a national curriculum taught outside of the schoolroom or distance education could help educational systems weakened by the loss of key workers.

Data given by HIV-positive patients during clinical registration include information about profession, education and dependents. These data can help policymakers anticipate future shortfalls in critical-skilled and semi-skilled professions. They would also allow Pretoria to mount job-training programs or to pre-arrange for dependent care through subsidized adoption of children either within the extended family network or outside it altogether.

A global solution would be a corps of skilled workers who cycled through areas experiencing shortages due to disease or other causes. In the developed world, a program not unlike the United States' Peace Corps could be set up to help fill healthcare, teaching and engineering

jobs. In the developing world, educated professionals experiencing difficulty finding jobs in their own countries could become global assets in specific skilled labor shortfalls.

On a national basis, continued careful and conservative management of monetary and fiscal policy, along with responsible debt servicing, continued privatization and other liberal economic measures should help steward the South African economy to steady growth levels. Keeping the costs of labor controlled, especially as the economy grows, is of key importance. It is essential that productivity increases should underpin wage increases so competitiveness for the South African economy can be maintained. Tax incentives to attract industry to develop the country could also encourage growth throughout the country, even for poorer areas such as the northwest. Establishing and *enforcing* solid immigration policies may likewise prove important to encouraging and maintaining economic growth. The tradition of regional migration for work is strong in South Africa and neighboring countries, but as more skill-specific jobs become available in country, making them available for *South Africans* will be a key to easing high unemployment in some sectors. How changes in immigration may (or may not) fit into South African Development Cooperation expansion and South Africa's other regional diplomatic efforts will be among the challenges for Pretoria to address if it is to lead the country through the HIV/AIDS crisis.

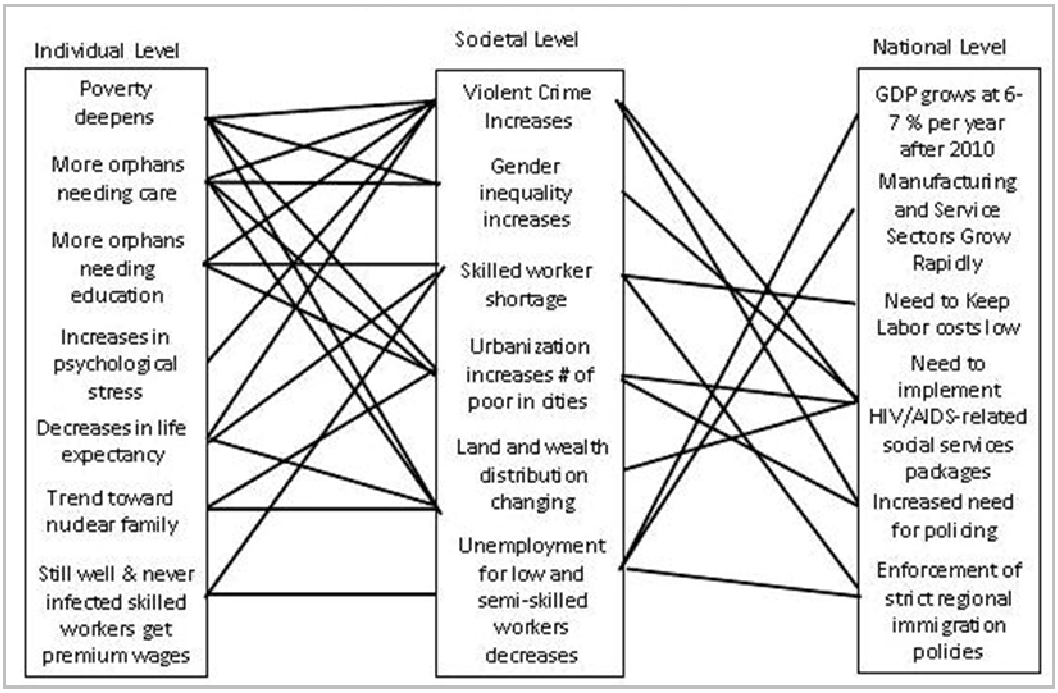
D.) Consequence Networks

A simple diagnostic tool that decision makers can use to help them determine which efforts could have the deepest, broadest, or most effective impact is the "consequence network". Borrowed from the concept of neural network design, a simplified chart linking issues at all three levels of society is shown in Figure 7. When using a consequence network, the important thing to keep in mind is that it functions more like an interdependent web than like an "if-then" decision tree; impacts can flow in any direction from one node to the next. Moreover, simply adding color to the lines can depict the difference between positive and negative impacts. On the chart above, for example, orphan care and education affect such far-flung issues as potential increases in violent crime and the ability of the government to keep labor costs low as the economy grows. (Other decision-making tools exist, of course, but the most important part of thinking the HIV/AIDS problem though is realizing the complexity of the troubles that arise—and recognizing that many, indeed most, of these simply can't be solved with regular visits to a medical clinic.)

6.) Conclusions

The use of different "optics" and "filters" to assess the prospective impact of HIV/AIDS in South Africa over time plainly demonstrates that the world is simply not going to be able to "treat" its way out of the HIV/AIDS epidemic with a narrow focus on medication. The disease is already too widespread for treatment to do more than keep ill individuals alive a few years longer. Life, to be sure, is precious. But it is precious for the infected and the non-infected alike. Treatment interventions by themselves are an inadequate, quick fix for the broad immensity of the HIV/AIDS crisis in South Africa. Without providing more of the social services and economic opportunities needed to improve the lives and futures of people whose lives have been extended by medication, the impact of the disease on South African society and state remains unaddressed. Likewise, by selecting which individuals receive treatment based solely on their health status and not on other issues such as job function or householder status, treatment programs will do little to mitigate potential economic impacts of the disease.

Figure 7. Simplified Consequence Network of HIV/AIDS Impact at the Individual, Societal and National Levels



Which interventions or program focuses will offer the best long-term solutions for addressing the troubles wrought by HIV/AIDS? The answer to that question really depends on the

epidemiological and demographic specifics of a given country or region; the most effective programs must consider multiple layers of complex societies, and not just the impact of the disease on individuals. Such an observation may fly in the face of the Hippocratic Oath, which obliges medical caregivers to use their powers of healing on the suffering in their immediate purview. But in a world of limited resources, to "overmedicalize" a national, or international, strategy for an epidemic so prevalent, disruptive and socially embedded as is HIV/AIDS today in South Africa is to risk transgressing the Hippocratic Oath's injunction to "do no harm".

Stopping or slowing the spread of infection would do more to alleviate impact at all three levels than would handing out medication to random individuals who are already very ill. Returning the programs' focuses back to prevention of infection would help mitigate the societal impact of HIV/AIDS. That said, "reinventing prevention" would be harder than it might seem, largely because it is unclear which preventative interventions were responsible for stemming the tide of disease in the much-touted success stories of Uganda and Thailand. Were abstinence education, public education, and stigma mitigation key to the successes of these prevention programs? Or was it high-level leadership? Unfortunately, no one yet knows the ultimate answer to these profound questions. However, something is better than nothing at all, which is nearly the current state of prevention programs in many countries.

In comparison to public-health messaging programs to combat diarrheal diseases or undernutrition, HIV/AIDS prevention does not get its share of media time because many low-income societies are averse to allowing sex-related issues on the airwaves. Given the many other problems inherent in implementing the next-generation of medication programs (expense, lack of human resources, etc.), continued limitation of HIV/AIDS public education, to the extent that such efforts facilitate prevention, may inadvertently result in even higher death tolls for some of the world's most vulnerable populations.

In addition to reinvigorating prevention programs, programs and efforts to provide social services to women and children, orphan caregivers and others in need will surely be necessary to address the impact of the disease. Schooling, legal help, monetary aid, or in-kind assistance in the form of food, resettlement, employment or simply transportation can all, in their respective ways, help ease the burden of those suffering with the disease, the uninfected and those at risk for infection. Continued use of clergy counseling to avoid infection and to help those already infected cope with HIV/AIDS is also desirable.

But dealing with South Africa's HIV/AIDS crisis will require more than medicines and social work. Plainly stated, good economic management will be critical to seeing the country through this long term epidemic: at both the individual and the national levels, the range of options possible will depend upon the economic resources available. For the fight against HIV/AIDS to be most successful, in other words, a clear focus on keeping the South Afri-

can economy on track will also be necessary. In enhancing the productive potential of the South African economy, there are obvious roles for international investors, and more generally for the private sector: after all high levels of FDI and job creation are two of the engines of macroeconomic success in South Africa (despite of the devastation of so much of the country's labor potential through HIV/AIDS). Additionally, building and implementing a hierarchical business model for skilled professions will mitigate future labor shortfalls as those infected with HIV/AIDS continue to die. Such planning may sound callous, or worse: but the consequences of ignoring such considerations may prove to be even more heartless, for uninfected and infected populations alike.

The needs of those infected with HIV/AIDS and societies and countries hard-hit by the disease are so great that many sorts of interventions will be welcome. In some places—perhaps including South Africa—those needs may seem almost limitless—certainly in relation to the resources available for coping with the epidemic.. This, in the final analysis, is why it is incumbent on us to think through, and comprehensively manage, the challenges presented by HIV/AIDS, instead of passively allowing the epidemic sweep over us or responding to its awful consequences in an ad hoc, "fire-fighting" basis.

This paper has emphasized the analytical importance of considering HIV/AIDS' different levels of impact. We have argued that looking at the problem with only one perspective can have unintended consequences. At the moment, the dominant perspective in addressing the HIV/AIDS crisis is the medical paradigm. The healing profession's mandate is a noble one—and it is socially essential. But it is also possible for the approach to a far-reaching social problem to be "overmedicalized". We can no longer simply assume that programs to extend lives will also automatically fill individual, societal and national needs. Rather, we hope decision makers will use some of the thoughts presented here to map out the problems and consider the multiple impacts their actions will have as they choose strategies for the best course of action. The health and demographic information presented here were specific to South Africa, but the analytical approaches in this paper (which recognize such concepts as issue complexity and connectedness and potential inadvertent consequences of well intentioned policies) can be applied to any nation hard hit by HIV/AIDS so as to guide programs designed to mitigate the impact of the disease.

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