GLOBAL HEALTH
MAGAZINE

Special Report on the State of HIV/AIDS in South Africa:

The country's leading HIV experts weigh in on the status of treatment, prevention and resourcing at the epicenter of the pandemic

It is axiomatic that the global fight against HIV/AIDS cannot be won without a decisive victory in South Africa, home to 20 percent of all people living with HIV/AIDS. So how is South Africa doing? And what is the likelihood it will meet the demand for essential prevention and treatment interventions by 2015? On Jan. 21 in Cape Town, Council on Foreign Relations Global Health Fellow Dr. Peter Navario convened a meeting of South Africa's foremost HIV/AIDS thinkers, policy-makers and practitioners to discuss the state of prevention and treatment at the epicenter of the pandemic. In this article, the experts weigh in on program gaps, the major challenges to achieving universal coverage of essential prevention and treatment interventions, and what it will take to surmount these challenges.

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Introduction

After nearly a decade of government intransigence on the domestic HIV/AIDS crisis, South Africa has made significant and laudable progress in the past few years. Today, nearly 1 million South Africans are receiving antiretroviral treatment, two-thirds of infected mothers have access to services to prevent HIV transmission from mother-to-child, and new surveillance data indicate declining prevalence among children and youth, as well as higher rates of condom use. Equally encouraging, the government has backed up its rhetoric with more money and progressive policies. The 2009-10 South African budget represented a 36 percent increase in HIV spending over the previous fiscal year, and significant year-on-year increases have been projected by the treasury through 2013. Substantial external funding from PEPFAR, the Global Fund, and others is also being maintained at least in the short run. And new guidelines published in April mean that more patients are now eligible for treatment, including pregnant mothers, children and people co-infected with HIV and TB.

Despite this recent spate of encouraging news, the South African epidemic remains as daunting as ever. Prevention interventions have failed to gain traction with between 350,000 and 500,000 new infections still occurring annually. Even under the most optimistic of projections, about 5 million more South Africans will become HIV infected over the next two decades – roughly the number infected today. Even with the anticipated domestic spending increases, just 2.1 million of the more than 3 million eligible patients will have access to treatment by 2013.

As a middle-income country with marked income inequality and the heaviest HIV burden in the world, South Africa will be a bellwether for other countries attempting to achieve technical and financial self-sufficiency in HIV and AIDS management. Its experience in the coming years will also have major repercussions for the other hyper-endemic countries in southern Africa. With 5.7 million infected people, South Africa remains the epicenter of the AIDS pandemic; the global AIDS fight cannot be won without a decisive victory in South Africa.

Recognizing the pivotal role for South Africa in the global AIDS fight, we report on the current state of prevention, treatment, capacity building and financing efforts in South Africa. We identify gaps, challenges and recommend strategies and tactics that will put South Africa on the path to achieving universal coverage[1*] of essential prevention and treatment interventions by 2015. One thing is clear, we have only just begun to address HIV in South Africa and without a sustained *acceleration* of prevention and treatment efforts and better, smarter use of financial resources through 2015, hundreds of thousands of South Africans will die.

Prevention: Too Few Tools, Too Little Data

In 2007, the South Africa Department of Health set the exceedingly ambitious goal of halving HIV incidence by 2011. There were two big problems with this target: first, due to poor incidence data, the baseline number of infections wasn't evident at the time, making it impossible to know if and when infections had been reduced by 50 percent. Second, in the absence of a game-changing intervention (e.g. a high-efficacy vaccine), the target was unrealistic – thanks to an epidemic that had not fully matured, a paucity of proven, targeted prevention tools for at-risk populations, and countervailing societal challenges, such as high levels of unemployment, persistent stigmatization of HIV, and unsatisfactory leadership.

Unfortunately, with the exception of political leadership, there have been few changes in the prevention practice since 2007, rendering the likelihood of halving HIV incidence by 2015 very low. In fact, the aids2031 (http://www.resultsfordevelopment.org/projects/aids2031-costs-and-financing-working-group) study for South Africa suggested that if only the current activities of the Department of Health's National Strategic Plan (NSP) (http://www.doh.gov.za/docs/misc/stratplan-f.html) are implemented, new infections will merely fall by about 20 percent over the next five years.

PMTCT: First, the Good News

Prevention of mother-to-child transmission (PMTCT) is one of the few bright spots in an otherwise bleak prevention landscape. Recent estimates indicate that nearly two-thirds of women in need of PMTCT services in South Africa received them in 2008, up sharply over previous years.

1* For our purposes "universal coverage" meant ≥80 percent of the population had access to a given intervention.

PMTCT Cascade: Typical Site versus Excellent Site

Typical Site		Mothers Lost	Excellent Site		Mothers Lost
Number of infected mothers	1000		Number of infected mothers	1000	
Enroll in antenatal care (90%)	900	100	Enroll in antenatal care (96%)	960	40
HIV Test / Labs Done (70%)	630	270	HIV Test / Labs Done (99%)	950	10
Receive medicines (50%)	315	315	Receive medicines (98%)	931	19
Estimated infected babies (transmission with HAART = 2% and without treatment = 25%)	6	172 (no ART)	Estimated infected babies (transmission with HAART = 2% and without treatment = 25%)	19	17 (no ART)
TOTAL INFECTIONS	**179**		**TOTAL INFECTIONS**	**36**	

And since the introduction of dual preventive therapy, the national laboratory service showed a drop in infant infections from 11 percent to 6.1 percent, which is close to the NSP target of less than 5 percent by 2011. Nevertheless, current coverage (80 percent) falls short of the goal to meet 95 percent of the need for PMTCT services by 2011, as articulated in the NSP, and there are still close to 30,000 babies born with HIV each year.

Obstacles to Universal PMTCT Access

The April 2010 guidelines added HAART for pregnant women with a CD4 count of less than 350 cells/mm^3, which should help boost maternal health and reduce transmission risk. However, at present, most PMTCT services, which are nested within antenatal care, lack the capacity to deliver HAART, and the new policy will require more laboratory monitoring, training and patient follow-up, all of which the South African health system has struggled to provide. Finally, transmission via infant feeding is frequently overlooked and has the potential to undo prevention gains achieved with drugs during birth.

Perhaps the biggest challenge in PMTCT is what experts call the "PMTCT cascade," referring to patient attrition at each step along the service continuum. Recent research conducted in Cape Town and presented at the International AIDS Society Conference in 2009 showed that the cascade (http://www.ias2009.org/pag/Abstracts.aspx?AID=3792) resulted in *actual* coverage rates around 50 percent despite the availability of services in more than two-thirds of antenatal facilities. As the table below shows, the difference between a typical site and a high performing site can be significant. Reasons for the cascade include human resource and infrastructural inadequacies (i.e. laboratory access), disaggregated services resulting in multiple clinic trips for patients and high out-of-pocket costs, poor health information, and a lack of community-based support services.

Coverage target within reach

Despite these challenges, South Africa appears to be on the path to achieving 95 percent coverage of PMTCT services and reducing mother to infant HIV transmission to less than 5 percent by 2015. In order to sustain the current momentum, issues of access, patient retention, and capacity must be addressed. First, all facilities that manage pregnant women must offer HAART. The department of health has said it is conducting a site-by-site review in order to alleviate facility-specific barriers to PMTCT provision; this process should be expedited. These reviews should also investigate and address the human and capacity constraints that underlie the PMTCT cascade.

Other priorities include treatment throughout the course of breastfeeding, either as extended daily nevirapine for babies or HAART for mothers, in order to prevent postnatal transmission. And finally, interventions to drive demand for antenatal services – social marketing and education campaigns – are needed to bring in more women during their first trimester for timely testing and treatment initiation.

Prevention among Adults

The past few years saw the completion of a number of clinical trials that examined a range of new prevention strategies, including male circumcision, vaginal microbicides, vaginal diaphragms, and behavioral interventions. Lamentably, only male circumcision showed any effectiveness in preventing HIV. The recent rollout of circumcision services in KwaZulu Natal supported by the Zulu King is potentially important depending upon demand and any adverse impact it may have on male sexual behavior (moral hazard), which could negate its benefits. Still, greater progress in preventing new infections is essential and we know how to do better.

Know Your Epidemic

The first step to mounting an effective prevention effort is to know your epidemic. Here's where the South African epidemic stands currently:

- HIV remains a generalized epidemic; prevalence has peaked at about 11 percent in the general population; as more people start ART the absolute number of HIV-infected people will likely increase, as may prevalence;
- Prevalence among 15-24 year olds has declined significantly over the past three years to 8.7 percent;
- A spike of new infections still occur in 18–21 year old women (more than 2 percent per annum) and men in their early 20s (more than 1.5 percent per annum);
- High rates of new infection (more than 1.5 percent per annum) are sustained beyond the age of 30 in both sexes;
- Geographic risk factors include living in informal settlements, urbanizing areas of rural districts, and transport corridors;
- Most-at-risk populations include prisoners, men who have sex with men, commercial sex workers,and orphaned teenagers (particularly girls).

Know Your Status

The next challenge is to ensure that people know their HIV status; too few South Africans possess this critical information. The new national testing campaign (http://www.thelancet.com/journals/lancet/article/PIIS0140-6736%2810%2960705-2/abstract) launched by President Zuma is an important start, but years of experience have shown traditional voluntary counseling and testing programs to be inadequate. New testing strategies like routine testing, which make it easier for people to be tested regularly, are urgently needed. And ultimately, of course, the success of testing campaigns rests on the ability of infected individuals to access life-saving antiretroviral treatment (ART) retroviral treatment (ART) and on the impact of these campaigns on the adoption of safe behaviors (especially regarding heterosexual behaviors in South Africa) by individuals and couples who receive counseling. Moreover, there is now empirical evidence (http://www.thelancet.com/journals/lancet/article/PIIS0140-6736%2810%2960705-2/abstract) – not just suspicion – that people are less infectious on ART, which should also help to reduce national incidence as more and more people start treatment.

Prevention Priorities

Future prevention strategies will be guided by the forthcoming '*Know Your Epidemic Survey*,' which consolidates national incidence and prevalence data, as well as information on epidemic drivers. The survey results suggest we will need to prioritize the following:

- Expand medical male circumcision programs;
- Promote and provide male and female condoms;
- Develop and evaluate prevention interventions for vulnerable groups, including men who have sex with men, commercial sex workers, young women and migrant workers;
- Implement and evaluate behavior change programs that target concurrent partnerships and other forms of sexual behavior that are associated with unsafe sex, such as intergenerational and transactional sex.

Measuring and evaluating interventions are often overlooked in prevention, and as a result there is a woeful lack of empirical evidence about what works and what does not. We must rectify this in the coming years in order to sharpen our tools and maximize impact in the face of limited resources. We also need multifaceted prevention packages that combine structural, behavioral and biomedical interventions, with an emphasis on accessibility and potency. And finally, the government must redouble its efforts to understand and address the structural drivers of the HIV epidemic, which likely include lack of economic opportunity, inadequate legal protection for people living with HIV and AIDS, gender inequity, and gender-based violence, to name a few.

Treatment: Real Progress

With nearly 1 million people on ART and approximately 250,000 initiations annually, South Africa now runs the world's largest HIV treatment program by some margin. Encouragingly, patients who remain on treatment appear to be doing well: failure rates among those on the first-line regimen have remained low, with just 3 percent of patients switching to the second-line regimen annually. Despite the large numbers on treatment, only about 50 percent of South Africans in need of ART receive it. Treatment coverage varies significantly by province: coverage in the Western Cape exceeds 80 percent, while some rural provinces have met only one-quarter of the estimated need for ART. Nevertheless, universal access has been achieved even in some relatively poorly resourced sub-districts, suggesting the potential for achieving universal access to ART by 2015.

Treatment Challenges

Until very recently, the biggest challenge to scaling up ART access was a lack of government action. With that issue now resolved, the treatment program has expanded exponentially in the past few years. But with 50 percent of the need for treatment still unmet (based on the old guidelines), challenges to achieving universal coverage remain. The first is a bureaucratic site certification process that has taken years to complete. Without this certification, health facilities cannot prescribe ART. There have also been problems with stock management – in a well-publicized 2009 incident, the Free State province ran out of money for drugs due to poor budgeting and planning. Stock-outs on a smaller scale continue to occur sporadically, jeopardizing patient adherence and well-being. Some treatment programs have witnessed a cascade of patient attrition similar to the one observed in PMTCT programs. Protracted counseling and testing protocols and slow laboratory results mean that a fraction of those initially tested end up on treatment, and too many die waiting to start.

Ultimately, the goal of treatment programs is not only to start patients on ART, but also to ensure that they remain adherent over the long-term. Side effects from stavudine – one of the first line drugs – have caused palatability problems for patients and driven up clinic visits and hospitalizations across the country. Finally, high rates of loss to follow-up (patients who stop taking treatment and cannot be located) have proved a significant problem. Research on true outcomes among patients lost to follow-up indicates that 50 percent of these patients are likely deceased.

Tactics for Expanded Treatment Coverage

Program growth must be sustained in order to achieve universal treatment access by 2015. Replacing problematic stavudine with tenofovir, a newer drug with fewer side-effects, was critical. Furthermore, the government has announced a national initiative to integrate HIV, tuberculosis and antenatal care services, which should improve convenience, facilitate holistic care, and reduce the treatment cascade. Because there are too few doctors in the public sector, nurses must be provided with the proper training and support to start patients on ART in primary care clinics. In addition to increasing treatment outlets, a commensurate effort is required to support patients already on treatment. Community health workers and other primary care support staff should be specifically tasked with patient tracking when drug pick-ups or clinic visits are missed.

Improved health system management will be essential to sustaining expansion of the national ART program. This includes better data management for tracking patients, measuring progress against targets, and managing the supply chain so that stock outs of drugs and essential supplies are eliminated. Along with a focus on data management, explicit target setting is needed from the national level all

the way down to sub-districts. The creation of targets will enable national and provincial health departments to identify laggards and swiftly address quality and access issues. Finally, pre-ART programs are needed to track patients and start them on treatment as soon as they are eligible. This should help with long-term planning as well as reducing the delay between establishing eligibility and starting ART. These steps, combined with the capacity building investments discussed in the next section, should enable South Africa to achieve universal ART access by 2015, assuming financing and capacity concerns are addressed in a timely manner. The more daunting challenge will be to sustain treatment and care services for millions of infected South Africans over the coming decades.

Capacity Building: New Model of HIV Care Required

Compared to most African countries, South Africa has one of the most advanced health systems, with human resources and spending almost evenly split between the private and public sectors. However, 80 percent of the demand for health care is in the public sector, including the vast majority of the nearly 6 million people living with HIV and AIDS. Although there are capacity constraints across the entire HIV care and treatment supply chain, this discussion will focus on three principal challenges.

The Wrong Model

The current curative, facility-based, hospital- and staff-intensive model of health care will never be able to address the needs and burden associated with HIV. There are too few doctors, nurses and other essential assets, and the system does not effectively reach rural populations. Simple mathematics reveals that management of more than 5 million people on a chronic basis dependent on fixed facilities and highly specialized staff is logistically untenable and would likely cannibalize the entire health budget. Moreover, non-health professionals, like community health workers, needed to drive critical programs such as prevention in communities, are too few in number and often ignored where they do exist.

Management and Leadership Capacity

Overall, the health system is managed and led by health professionals, most of whom lack formal management or leadership training. Deficits in management and leadership skills have contributed to unchecked epidemic growth, as well as the relative inability to address it effectively in areas of prevention, treatment and care. The recent drug stock outs are but one example.

Monitoring, Evaluation and Health Information Systems

The success of any HIV program hinges on the health-care provider's ability to evaluate patient and program outcomes easily and to intervene when needed. This is virtually impossible with most of the public sector data management systems currently in use. Perhaps most egregious is the lack of a unique patient identification (ID) number; this complicates patient tracking and causes confusion with patient files and laboratory results. Health information systems are fragmented and data are generally of poor quality and rarely used for program improvement, planning or prioritization.

Addressing Capacity Challenges

The first capacity building priority should be the development of a wellness-based model of care that emphasizes prevention and chronic care. Hospitals and clinics are built for crisis management, not to manage millions of essentially "well" patients. If HIV is to be effectively and sustainably managed, HIV care in South Africa must evolve new capacity to manage millions in perpetuity. Care must be rooted in communities with individuals, families and community health workers (CHWs) as the first line of "care providers." A strong multidisciplinary CHW program should be developed as the centerpiece of this community-based care system and should provide health education, psychosocial support, and basic outcomes monitoring. Moving the locus of first-line care and "wellness" activities from the clinics to the communities frees facilities to concentrate on the medical aspects of patient management and allows the curative component of the health system to eventually catch up with demand.

Addressing the health management gap will require a two-pronged approach: (1) a rapid, practical, on-the-job training program for existing managers in the near-term; (2) formal, qualification-based management and leadership training for future managers. On-the-job training must teach basic management skills, including effective meetings management, problem solving, strategy formulation, project management, work-plan development and work delegation. Subsequently, a formal qualification in health management should be offered to hospital/clinic managers and selected individuals and teams in senior roles such as procurement, logistics management, and financial management.

Efficiencies must also be achieved with existing resources. Largely untapped private health-care capacity should be better leveraged. Many successful frameworks for public-private partnerships exist and the government should adopt and implement a few of these on a trial basis, and refine and consolidate them over time. The advent of national health insurance provides additional context for the rapid development of a public-private framework that can address HIV as well as other primary care needs. Opportunities for task shifting should be identified system-wide, drug refills should be automated where possible, laboratory test results should be available electronically on the web, and as many basic laboratory tests as possible should be site-based.

Finally, the national department of health should immediately develop and implement a unique ID that follows individuals across time and space. This must be followed by the implementation of effective health management information systems that yield good quality data and information that can be used for program management, planning and improvement. Provincial and national departments of health must stop dithering about selecting a data system, as this behavior is now impinging on the quality and quantity of care delivered. In the absence of a provincial decision regarding a database, districts should be permitted to implement their own data management solutions built around a standardized set of program indicators.

Costs and Financing: An Uncertain Future

South Africa is facing a significant financial challenge in responding to its HIV/AIDS epidemic. The demand for resources on three critical fronts – prevention, treatment and care of orphans and others affected by AIDS – is escalating rapidly.

Future costs

There have been a number of attempts to project resource needs, most notably for the recent aids2031 project. This project modeled three possible scenarios, all of which showed costs rising rapidly growing from ZAR10-15 billion (US$ 1.3-2.0 billion) during 2007-2009 to ZAR30-37 billion (US$ 4.0-4.9 billion) by 2015-16. The majority of costs (60-70 percent) are for treatment – but these estimates could be reduced through more efficient government procurement practices, and by lower unit costs of labor and other inputs if South Africa adopts more community-based models for delivering ART. This anticipated two- to three-fold increase in program costs as numbers on treatment increase from 1 million to 3 million, will put considerable pressure on the government and the South African economy if it is to come from domestic resources.

The longer-term view is equally precarious. Epidemic models suggest that numbers on treatment will level off at between 3-3.5 million by 2015. Costs should also plateau at between ZAR30-42 billion (~US$4.0-5.5 billion), depending on national policies, the prevention program success, and investments in programs that aim to reduce vulnerabilities among AIDS orphans and affected communities. For international donors, the likely scenario is an expanding need for assistance through 2015-16, at which point self-sustained financing is more feasible.

In the absence of a game-changing new technology that prevents HIV transmission, large numbers of new HIV infections will occur in the coming years. Under an expanded response scenario (the most expensive), new infections would fall from about 450,000 per year today to 200,000 in 2020 – thus achieving (albeit nine years late) the current goal of cutting incidence by half. It would also prevent a total of 6 million additional infections, compared to the baseline scenario in which no further expansion of prevention takes place from 2010 onward.

Tough Choices

Difficult choices lay ahead, given the impending financing gap. Domestic financing will need to increase beyond what

has already been announced, but the potential for doing so may be limited. The U.S. President's Emergency Plan for AIDS Relief (PEFPAR), which has provided nearly half of dedicated programmatic HIV financing in South Africa since 2004, is unlikely to increase its contribution in the next few years due to tight budgets and competing global health priorities.

The recent announcement of a 30 percent increase in the 2010 health budget and significant budget increases through 2012 is a promising development. Nonetheless, progressive growth in the number of new ART patients to >400 000 per annum will lead to a funding gap that will need to be regularly reviewed and addressed.

In the light of this impending gap, resource mobilization strategies need to be defined for the next three to five years. Internally, efficiency gains and commitments from the private sector could help to close the financing gap. Structured discussions with external partners around improving the predictability of outside funding will also help. Evidence of prevention and treatment gains should assist with convincing PEPFAR, the Global Fund, and other outside sources that their funding is producing meaningful results. In late 2010 or 2011, the government might wish to consider a structured "all party" AIDS financing meeting for provincial authorities, the business sector, and major donors to agree on a government-led medium-term financing plan for the country.

Conclusion

The latest developments in South Africa are simultaneously encouraging and daunting. Remarkable progress has been made in rolling out HAART, and PMTCT access is approaching the universal access threshold. Furthermore, recently published incidence estimates show an incredible 60 percent decrease in infections between 2005 and 2008 among women aged 15-24, offering hope for a sea change in the South African epidemic. Still, with an estimated incidence of 2.2 infections per 100 people per year in that same cohort, there is work to be done.

This paper stresses the need for a focus on fundamentals and leadership in order to change the trajectory of the epidemic. At the facility level, universal access to HAART and PMTCT services must be made prioritized, and nurses and midwives trained to provide HAART. Communities across the country will need to assume a pivotal role in preventing new infections and providing supportive care; community leaders need to discuss HIV prevention routinely and stamp out epidemic drivers that vary from place to place. It is also time for public and private sector antipathy to end; without private resources, the national fight against HIV is unlikely to be won, and leaders from both sectors must unite around shared prevention and treatment goals. Finally, the government will need to show uncommon leadership over the next few years on issues ranging from cost containment (particularly for drugs) and financing, to prevention and treatment policy, where difficult decisions will need to be made. We believe that with such focus, leadership, collaboration and commitment, South Africa can change the course of HIV infection nationally, achieve Millennium Development Goal 6, and cement its leadership role in the global fight against HIV and AIDS.