



Improving Health Outcomes Through Concurrent HIV Program Scale-Up and Health System Development in Rwanda: 20 Years of Experience

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Scholarly Report submitted in partial fulfillment of the MD Degree at Harvard Medical

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Scholarly Report: Improving health outcomes through concurrent HIV program scale-up and health system development in Rwanda: 20 years of experience

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Abstract

The 1994 genocide against the Tutsi destroyed the health system in Rwanda. It is impressive that a small country like Rwanda has advanced its health system to the point of now offering near universal health insurance coverage. Through a series of strategic structural changes to its health system, catalyzed through international assistance, Rwanda has demonstrated a commitment towards improving patient and population health indicators. In particular, the rapid scale up of antiretroviral therapy (ART) has become a great success story for Rwanda. The country achieved universal coverage of ART at a CD4 cell count of 200 cells/mm³ in 2007 and increased the threshold for initiation of ART to ≤ 350 cells/mm³ in 2008. Further, 2013 guidelines raised the threshold for initiation to ≤ 500 cells/mm³ and suggest immediate therapy for key affected populations. In 2015, guidelines recommend offering immediate treatment to all patients. By reviewing the history of HIV and the scale-up of treatment delivery in Rwanda since the genocide, this paper highlights some of the key innovations of the Government of Rwanda and demonstrates the ways in which the national response to the HIV epidemic has catalyzed the implementation of interventions that have helped strengthen the overall health system.

Intellectual Contribution and Role in the Project

The aim of our project was to review the literature written about the HIV/AIDS epidemic in Rwanda, document the country's response over 20 years to the epidemic, and suggest a few potential strategies that contributed to certain successes in the treatment and prevention of the disease within Rwanda. As a student researcher, my role in the project was to draft a background paper reviewing the scientific, epidemiologic, and large scale treatment literature written about Rwanda from 1990 - 2010. I was an intern for the Rwanda Biomedical Center under the leadership of the lead author, Dr. Nsanzimana. With close collaboration with Dr. Nsanzimana, I reviewed relevant academic literature and government documents that he had obtained, and interviewed key physicians and political officials (including the former Minister of Health) who had participated in Rwandan health policy and strategy during the 1990s to understand the strategies of Rwandan policymakers in crafting a treatment strategy for HIV/AIDS and an epidemiological surveillance strategy after the genocide. Over my internship I drafted a background paper that included an introduction to the challenges of treatment, a survey of the epidemiology of HIV, and evidence of how Rwanda was able to respond to the HIV epidemic.

In addition to compiling the background research for the eventual paper and creating a background draft, I also helped formulate the outline of the eventual paper and contributed ideas to how to organize our paper as well as our argument, contributing ideas of how we should chronologically segment our paper into distinct phases of HIV responses. I developed arguments about the cultural aspects of Rwanda that were employed to help create a culture of accountability within the health system, as well as documentation about health system innovations such as performance based financing, decentralization of health service provision, and the creation of affordable health insurance for the poor. Attached in appendix 1 is my background paper in full.

Dr. Nsanzimana conceptualized the project, drafted the manuscript, and conducted semi-structured interviews with key policy makers and was the lead author of the paper. Dr. Binagwaho, Dr. Drobac, and Dr. Farmer provided supervision and guidance regarding the draft manuscript for the final paper. Haley McDermott also was a research assistant and helped with iterative drafting of manuscript drafts. Dr. Karita provided strategic guidance and academic input into the draft.

Contribution to the Field

Since the genocide, Rwanda has undergone a remarkable transformation. It has ushered in some of the highest levels of economic growth in Africa, significantly reduced extreme poverty, prevented the reoccurrence of mass violence, and raised life expectancy from 48 years in 1990 to 62 years in 2010 for men, recovering from a low of 28 years during the genocide. This rapid rate of progress has been no less true in the realm of HIV/AIDS treatment. Though in 2002 the prohibitive cost of medicines resulted in only an estimated 870 people receiving treatment, just ten years later, Rwanda had managed to place 115,000 people on HIV treatment free at the point of delivery. This represented 91.5% coverage of people eligible for treatment, making Rwanda

one of two African countries to achieve the United Nations goal of universal coverage. Mortality associated with HIV disease fell by 78.4%, the greatest reduction in the world from 2002-2012. Rwanda was not only able to rapidly increase the initiation of new patients onto ART; it was also able to ensure quality care from the beginning of the scale-up period by retaining patients on treatment, achieving improved immunological outcomes as a result. Not many would have expected a country like Rwanda to recover its health system from the destruction of the genocide, let alone achieve universal treatment coverage for a disease as complex as HIV/AIDS. This paper seeks to explain these outcomes by analyzing three critical themes of the Rwandan health system: accountability, accessibility, and the efficient use of funding to strengthen the health system. This paper reviews the evidence on HIV/AIDS treatment outcomes within Rwanda and explain how leadership and governance at the national and local levels have formatively shaped Rwanda's HIV/AIDS achievements. It also reviews the strategic measures taken by the Government of Rwanda to improve geographic and economic accessibility to the health system. Finally, this paper describes the strategies the Government of Rwanda has employed to use HIV/AIDS funds to strengthen its broader health system without sacrificing quality of care for HIV/AIDS patients.

Few papers have attempted to take insights from both the published literature and key policymakers to synthesize a series of hypotheses to explain why Rwanda was able to achieve such remarkable HIV/AIDS and health systems strengthening achievements within a span of 20 years. This paper fills in gaps regarding the key strategies Rwandan health policymakers employed to both scale the number of people initiated on treatment and ensure that high rates of patients continued treatment. Some of these strategies are applicable and generalizable to all sub-Saharan African countries, while other strategies are more specific to the Rwandan cultural and social context. This paper is an attempt to build a wider body of research that explicitly attempts to outline policy teachings that may inform the efforts of health policymakers in other countries to build stronger health systems.

Link and Citation to paper

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Link: <http://bmcmmedicine.biomedcentral.com/articles/10.1186/s12916-015-0443-z>

Appendix 1: Background Paper draft by Krishna Prabhu

Health systems strengthening through HIV treatment scale-up: A ten year review of the Rwandan experience

Introduction

In the wake of the 1994 genocide, in which one million people were killed and two million left homeless, Rwanda was one of the poorest countries in the world.¹ The health and education sectors of Rwandan society – already weakened prior to the genocide - were in disarray. The genocide had not only left physical health infrastructure in ruins, but had triggered the acute loss of medical personnel, with some studies suggesting that nearly 80% of physicians had been killed or fled during the genocide.² Interviews of post-genocide government officials revealed that fewer than 10 pediatricians were practicing in Rwanda in the year following the genocide.³ Estimates of health indicators between 1989 until 1997 showed that Rwanda had the lowest life expectancy of any country in the world.⁴ Premature mortality was fueled by deaths from epidemic infectious diseases, including AIDS, tuberculosis, malaria.⁵ That only 5% of the population could access clean water further contributed to morbidity and mortality from waterborne infections. Communicable disease was layered on top of non-communicable disease morbidity, with an especially high burden of mental illness caused by the social trauma of the genocide.⁶

Since the genocide, Rwanda has undergone a remarkable transformation. It has ushered in some of the highest levels of economic growth in Africa, resulting in a tripling of its GNP over the past decade.⁷ Extreme poverty – at a high of 77.8% in 1994 – had fallen to 44.9% by 2011.⁸ Mass violence has not reoccurred within Rwanda. Life expectancy for men has risen from 48 years in 1990 to 62 years in 2010,⁹ recovering from a low of 28 years during the genocide.¹⁰ Through a concerted rebuilding of its health system, Rwanda is on track to achieve the health targets of the Millennium development goals.¹¹

This rapid rate of progress has been no less true in the realm of HIV/AIDS treatment. Upon the introduction of Highly Active Antiretroviral Therapy (HAART) to world markets in 1996, the drugs were initially unavailable for purchase in Rwanda, requiring wealthy HIV+ Rwandans to travel to Uganda on a monthly basis to purchase medicines.¹² By 2002 the situation was not much improved, with only an estimated 870 people receiving treatment, most of whom paid for medicines out of

¹ Uvin P. Aiding violence: the development enterprise in Rwanda. Kumarian Press. 1998

² Omaar R. Rwanda: Death, Despair, and Defiance. London, England: African Rights; 1994.

³ Geltman, Stover. "Genocide and the Plight of Children in Rwanda." JAMA, January 22 1997

⁴ DataBank: world development indicators and global development finance. Washington, D.C.: World Bank, 2012. (Accessed July 29, 2013, at <http://databank.worldbank.org/>.)

⁵ World health statistics 2012. Geneva, Switzerland: World Health Organization, 2012.

(Accessed January 29, 2013, at http://www.who.int/gho/publications/world_health_statistics/2012/en/.)

⁶ Republic of Rwanda Ministry of Health. National Mental Health Policy of Rwanda. <http://moh.gov.rw/english/wp-content/uploads/2012/05/Posted-National-Mental-health-Policy-1.pdf>

⁷ DataBank: world development indicators and global development finance. Washington, D.C.: World Bank, 2012. (Accessed July 29, 2013, at <http://databank.worldbank.org/>.)

⁸ *Ibid*

⁹ Joshua A Salomon, Haidong Wang, Michael K Freeman, Theo Vos, Abraham D Flaxman, Alan D Lopez, Christopher JL Murray, Healthy life expectancy for 187 countries, 1990–2010: a systematic analysis for the Global Burden Disease Study 2010, The Lancet, Volume 380, Issue 9859, 15 December 2012–4 January 2013, Pages 2144-2162

¹⁰ DataBank: world development indicators and global development finance. Washington, D.C.: World Bank, 2012. (Accessed July 29, 2013, at <http://databank.worldbank.org/>.)

¹¹ Paul Farmer, et al. "Reduced Premature mortality in Rwanda: lessons from success." BMJ 2013; 346:f65

¹² Etienne Karita personal communication

pocket and received care in private clinics or public referral hospitals.¹³ Yet just ten years later, Rwanda had managed to place 115,000 people on HIV treatment free at the point of delivery.¹⁴ This represented 91.5% coverage of people eligible for treatment,¹⁵ making Rwanda one of two African countries to achieve the United Nations goal of universal coverage.¹⁶ Mortality associated with HIV disease fell by 78.4%, the greatest reduction in the world from 2002-2012.¹⁷ Indeed, the evidence shows that not only has Rwanda been able to initiate a great number of eligible people on treatment, but that it has built a system capable of retaining those people on treatment successfully.¹⁸ This has happened as Rwanda has concertedly prevented the creation of parallel health systems by taking advantage of donor, government, and patient contributions to truly integrate HIV/AIDS services into the broader health system.

Not many would have expected a country like Rwanda to recover its health system from the destruction of the genocide, let alone achieve universal treatment coverage for a disease as complex as HIV/AIDS. What allowed Rwanda to scale up the delivery of HIV/AIDS medicines so quickly? What key innovations did the Government of Rwanda implement to achieve universal coverage? Why was HIV/AIDS considered a priority? This paper seeks to explain these outcomes by analyzing three critical themes of the Rwandan health system: accountability, accessibility, and the efficient use of funding to strengthen the health system. First, this paper will review the evidence on HIV/AIDS treatment outcomes within Rwanda, placing it within the context of trends in other health priorities. Next, it will explain how leadership and governance at the national and local levels have created a culture of accountability and local ownership throughout the health system, which has formatively shaped Rwanda's HIV/AIDS achievements. The next section reviews the strategic measures taken by the Government of Rwanda to improve structural accessibility to the health system for patients, both economically and geographically. The final section describes the strategies the Government of Rwanda has employed to use HIV/AIDS funds to strengthen its broader health system without sacrificing quality of care for HIV/AIDS patients. The paper concludes by offering lessons that other countries may draw from, in addition to the challenges that Rwanda continues to face.

¹³ Rwanda Biomedical Center. National Annual Report on HIV/AIDS July 2010 – June 1 Kigali, Rwanda October 2012, http://data.unaids.org/pub/Report/2010/rwanda_2010_country_progress_report_en.pdf

¹⁴ Rwanda Biomedical Center. National Annual Report on HIV/AIDS July 2012 – June 2013. Kigali, Rwanda October 2012.

¹⁵ *Ibid*

¹⁶ World Health Organization. Joint United Nations Program on HIV/AIDS, United Nations Children's Fund. Towards universal access: scaling up priority HIV/AIDS Interventions in the health sector. 2010. www.who.int/hiv/pub/2010progressreport/en/index.html

¹⁷ World health Organization. World Health Statistics 2012. www.who.int/gho/publications/world_health_statistics/2012/en

¹⁸ Jean Nyemazi Thesis 2012

HIV/AIDS Treatment Trends in Rwanda

Treatment Coverage Rates

HIV was first identified in Rwanda in 1983 by a team of Belgian scientists,¹⁹ prompting the launching of a population-based seroprevalence survey that found an urban prevalence of 17.98% and a rural prevalence of 1.3% in 1986.²⁰

The distribution of the epidemic was altered both during and after the genocide, a period in which rape was used as a tool of war against thousands of women and led to further HIV infection, on top of inflicting psychosocial trauma.²¹⁻²² The aftermath of the genocide also led to massive population movements, with high levels of migration both into and out of Rwanda. Population movement is also thought to have altered the distribution of the epidemic, with rural areas in particular witnessing an increase in prevalence rates compared to pre-genocide levels,²³ though there still remains a wide rural-urban divide in prevalence rates.²⁴

Despite the emergence of a generalized HIV epidemic, the Government of Rwanda was unable to afford purchasing newly released antiretroviral drugs in 1996, and international donor support was lacking. In an annual report in 1996, USAID estimated that nearly 70% of humanitarian assistance to Rwanda was channeled to refugees in asylum countries, some of whom participated in the genocide, while admitting that “the plight of survivors, especially women, has been seriously neglected.”²⁵ Like many sub-Saharan African countries at the time, the lack of donor funding and governmental public resources initially made ARV therapy out of reach, and was exacerbated by the fact that the total cost for HIV treatment reached upwards of \$6065 per patient per year in 1999, with antiretroviral prices accounting for 92% of the total cost of care.²⁶ At the same time, 84% of total spending on HIV/AIDS care in Rwanda was not for expensive antiretroviral therapy but rather treatment for symptoms and opportunistic infections.²⁷ By 1999 only 202 HIV positive people in Rwanda were able to afford the out-of-pocket expense of purchasing ARVs on global markets.²⁸

¹⁹ Van de Perre P, Rouvroy D, Lepage P, et al. Acquired immunodeficiency syndrome in Rwanda. *Lancet* 1984;ii:62–5.

²⁰ Nationwide community-based serological survey of HIV-1 and other human retrovirus infections in a central African country. Rwandan HIV Seroprevalence Study Group. *Lancet* 1989;i:941–3

²¹ **Donovan** 2002 Rape and HIV/AIDS in Rwanda. *Lancet* Dec 2002 Vol 360, Supplement 1 pg s17-s18

²² **African Rights 2004** Rwanda: Broken Bodies, Torn Spirits - Living with Genocide, Rape and HIV/AIDS. Kigali, Rwanda

²³ Leroy V, Ntawiniga P, Nziyumvira A, et al. HIV prevalence among pregnant women in Kigali, Rwanda. *Lancet* 1995;346:1488–9.

²⁴ Kayirangwa, et al – Current Trends in Rwanda’s HIV Epidemic – Sex transmitted infection 2006

²⁵ US Agency for International Development Annual Outcomes Report FY1997. Arlington, Va: US Agency for International Development; 1996. Pg 512

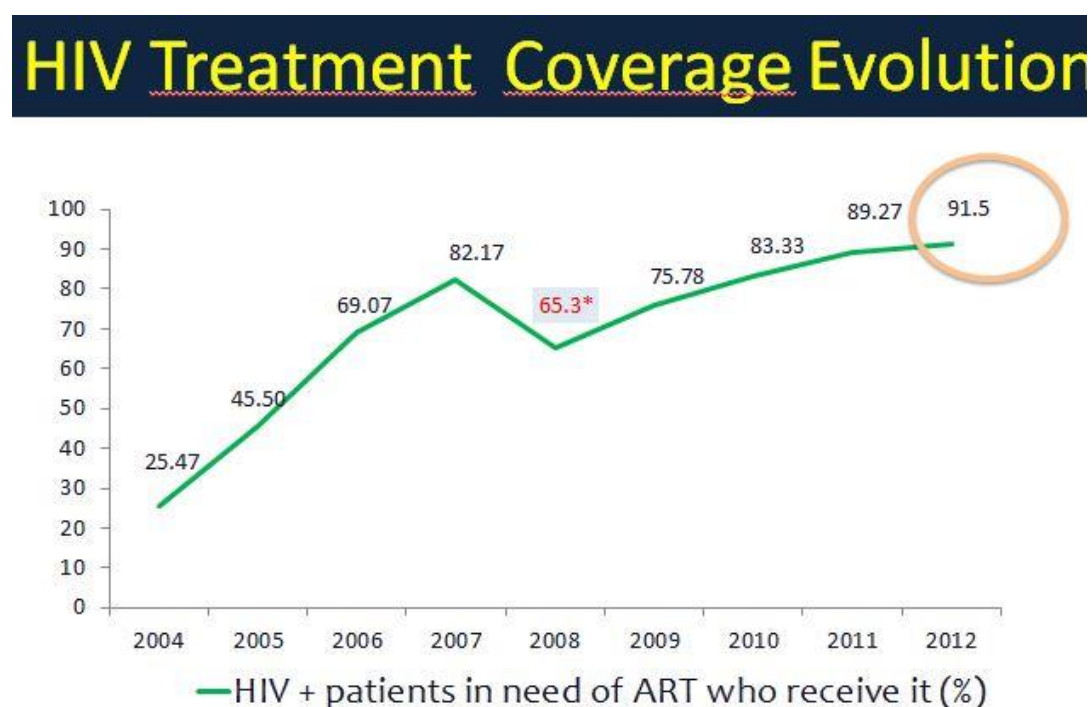
²⁶ Schneider P et al., Rwanda National Health Accounts 1998. Technical Report No. 53. Bethesda, MD: Partnerships for Health Reform Project, Abt Associates Inc. September 2000, pg 55

²⁷ Schneider P et al., Rwanda National Health Accounts 1998. Technical Report No. 53. Bethesda, MD: Partnerships for Health Reform Project, Abt Associates Inc. September 2000

²⁸ *Ibid*

By 2002 antenatal sentinel surveillance estimates indicated that median urban HIV prevalence was at 6.9% while median rural HIV prevalence was 3%.²⁹ But because access to HIV therapy was still based on ability to pay rather than need, it is perhaps unsurprising that in 2002 there were only 870 people on treatment. Yet by 2010 Rwanda had achieved universal ART coverage as defined by the WHO, and as of 2012 Rwanda managed to place 107,021 adults and 7,975 children living with HIV on treatment, representing 91.5% coverage of those eligible for treatment.³⁰

Figure 1



Treatment Retention and Immunological Outcomes

Rwanda was not only able to rapidly increase the initiation of new patients onto ART; it was also able to ensure quality care from the beginning of the scale-up period by retaining patients on treatment, achieving improved immunological outcomes as a result. A nationally representative retrospective cohort study of HIV adult patients initiating treatment between January 1 2004 and December 31 2005 indicated an average of 92% and 86% retention after 6 month and 12 months, respectively. Among patients who were retained, the study found increases in both CD4 count and weight for males and females.³¹ These retention rates compare favorably to evaluations of retention in other sub-Saharan African countries. One systematic review published in 2007 on non-research

²⁹ Treatment and Research AIDS Center (TRAC), “HIV Sentinel Surveillance Among Pregnant Women Attending Antenatal Clinics”, Republic of Rwanda Ministry of Health/CDC, Rwanda 2002, p.15.

³⁰ RBC HIV Report 2012-2013 (forthcoming)

³¹ Lowrance, et al. “Adult clinical and immunologic outcomes of the national ART treatment program in Rwanda during 2004-05.” JAIDS 2009

ART programs in sub-Saharan Africa, both with and without donor support, found a median retention rate of 79.1%, 75%, 61.6% at 6, 12, and 24 months respectively.³²

Rwanda fared better in retention even within the same NGO that was implementing ART projects across several African countries. In a comparative study of 17,712 children initiated on ART at 192 facilities across five different countries (Kenya, Mozambique, Rwanda, and Tanzania) by the same NGO between 2005 and 2011, Rwanda achieved an average retention rate of 95 and 93% by 12 and 24 months compared to a study-wide average retention rate of 80% and 72% by 12 and 24 months, respectively.³³

More recent studies have confirmed that Rwanda's ART retention was not simply an artifact of enthusiasm for a new treatment program. One study on a cohort of patients initiated between 2005 and 2006 tested the immunologic outcomes of a program that utilized community health workers to directly observe ART, in addition to providing wrap-around services of such as nutritional assistance, travel allowances for routine visits, and comprehensive medical care. The study found that it was able to retain nearly 92.3% on care, in addition to achieving a median increase in CD4 count of 336 cells per microliter and reductions in viral load for 84% of patients.³⁴ A follow-up study found that using a package of community-based interventions increased the likelihood of retaining patients and suppressing their viral load compared to standard services offered by the Government of Rwanda in most health centers.³⁵ Still, the study found that the standard government model of care achieved high levels of retention (87%), and that viral load suppression exceeded 90% among patients retained in government programs. The high quality of government ART services was later confirmed by a large retrospective study that drew on available routine health center data of 35,101 patients across 35% of ART sites nationwide, which found patient retention levels of 95.9%, 94%, 91.4%, and 89.9% for patients 6, 12, 24, and 36 months after initiation, respectively.³⁶ Another large study on a nationally representative cohort of patients found viral load suppression in 86% of Rwandan patients after 18 months of treatment in government facilities.³⁷ The high rates of ART initiation in Rwanda has gone hand in hand with the provision of high

³² Rosen S, Fox MP, Gill CJ. Patient retention in antiretroviral therapy programs in sub-Saharan Africa: a systematic review. *PLoS medicine* [Internet]. 2007 Oct 16 [cited 2012 Jul 17];4(10):e298.

³³ McNairy, et al. "Retention of HIV-infected Children on Antiretroviral Treatment in HIV care and Treatment programs in Kenya, Mozambique, Rwanda, and Tanzania. *JAIDS* 2013.

³⁴ Rich, et al 2012. "Excellent Clinical Outcomes and High Retention in Care Among Adults in a community-based HIV treatment program in Rural Rwanda." *JAIDS* Vol 59, No 3 March 1, 2012

³⁵ Franke, et al 2013. "Improved retention associated with community-based accompaniment for Antiretroviral therapy delivery in Rural Rwanda." *Clinical Infectious Diseases* 2013

³⁶ Jean Nyemazi

³⁷ Elul B et al. High levels of adherence and viral suppression in a nationally representative sample of HIV-infected adults on antiretroviral therapy for 6, 12 and 18 months in Rwanda. *PLoS One*, 2013, 8:e53586.

quality care. .

Table 4 Adult Patient Outcomes at 6, 12, 24 and 36 Months (N=35,101)

Outcomes	6 months	12 months	24 months	36 months
Alive in care	28,215 (95.9)	27,657 (94.0)	26,895 (91.4)	26,450 (89.9)
Dead	1,041 (3.5)	1,347 (4.6)	1,697 (5.8)	1,891 (6.4)
Lost to follow up	171 (0.6)	423 (1.4)	835 (2.8)	1,086 (3.7)
Transferred out	1,032 (2.9)	2,218 (6.3)	4,259 (12.1)	5,674 (16.2)

Health System Strengthening through HIV/AIDS

One common fear of focusing on the treatment of HIV/AIDS is that such attention may detract from treating other health priorities,³⁸ create local brain drain,³⁹ or even undermine attention to strengthening the health system.^{40,41,42,43} However these fears have not come to pass in Rwanda. Between 2005 and 2011 deaths from malaria dropped by 87.3%.⁴⁴ From 2000 to 2010, Rwanda's maternal mortality ratio fell by 59.5%.⁴⁵ Between 2000 and 2011 the absolute number of child deaths annually fell by 62.8%,⁴⁶ even as the population increased by 35.1%.⁴⁷ Despite the increase in premature mortality from the genocide, in addition to epidemics of infectious disease, Rwanda's life expectancy for men has increased from 48 years in 1990 to 62 years in 2010.⁴⁸

Recent studies have shown that attention to HIV/AIDS has not compromised care for other health priorities, and in some cases evidence suggests that HIV/AIDS service provision actually strengthened the provision of non-HIV services. One controlled study compared health outputs

³⁸ Shiffman, J. (2006). HIV/AIDS and the rest of the global health agenda. *Bulletin of the World Health Organization*, 84(12), 921.

³⁹ De Maeseneer, J., van Weel, C., Egilman, D., Mfenyana, K., Kaufman, A., Sewankambo, N., et al. (2008). Funding for primary health care in developing countries: Money from disease specific projects could be used to strengthen primary care. *British Medical Journal*, 336, 518-519.

⁴⁰ Segall, M. (2003). District health systems in a neoliberal world: A review of five key policy areas. *International Journal of Health Planning and Management*, 18, S5-S26.

⁴¹ Hsiao WC, 2007. Why is a systemic view of health financing necessary? *Health Aff (Millwood)* 26: 950-961.

⁴² Schieber G, Gottret P, Fleisher L, Leive A, 2007. Financing global health: mission unaccomplished. *Health Aff* 26: 921.

⁴³ Lewis M, 2005. Addressing the Challenge of HIV/AIDS: Macroeconomic, Fiscal and Institutional Issues. Washington, DC: Center for Global Development.

⁴⁴ World Health Organization. World Malaria report 2012 → find website, update to 2013

⁴⁵ World Health Organization, United Nations Children's Fund, United Nations Population Fund, World Bank. (2012). Trends in Maternal Mortality: 1990 to 2010. Geneva, Switzerland, World Health Organization → find website!

⁴⁶ United Nations Children's Fund, World Health Organization, World Bank, United Nations Population Division. Levels and trends in child mortality. 2012

⁴⁷ World Bank. Databank: world development indicators and global development finance. 2012. <http://databank.worldbank.org/>.

⁴⁸ Joshua A Salomon, Haidong Wang, Michael K Freeman, Theo Vos, Abraham D Flaxman, Alan D Lopez, Christopher JL Murray, Healthy life expectancy for 187 countries, 1990-2010: a systematic analysis for the Global Burden Disease Study 2010, *The Lancet*, Volume 380, Issue 9859, 15 December 2012-4 January 2013, Pages 2144-2162

between health centers that started offering comprehensive HIV services from 2002 – 2006 and health centers that did not offer HIV/AIDS services, finding no evidence that non-HIV health priorities suffered when HIV/AIDS services were introduced. In fact, the study found that HIV/AIDS health centers were statistically more likely to vaccinate children for BCG.⁴⁹ Other comparative studies found statistically significant increases in the provision of some preventive services at health centers offering HIV/AIDS care, including reproductive health services,⁵⁰ suggesting that HIV/AIDS funding was used to increase the general capacity of primary health care centers. As will become clear in subsequent sections, the Government of Rwanda intentionally used patient contributions, government resources, and donor funds to achieve success on multiple health fronts, managing to circumvent the fear that influxes of verticalized funding would weaken the health system.

1. Accountability

National and Local Governance

Beginning in 2006, His Excellency President Paul Kagame launched a neo-traditional accountability system called *imihigo* at all levels of government, from ministers of state down to local mayors. Rooted in pre-colonial tradition, imihigo was a public declaration made by warriors proclaiming what they would accomplish in battle, with shame and humiliation directed at those who did not fulfill their imihigo. Such declarations functioned as a public contract that was understandable by the surrounding community, creating social mechanisms through which warriors could be held to account for their promises.

In 2004, central government officials recognized that many of central government bureaucrats had lived a significant portion of their lives outside of Rwanda in exile, and thus needed strong local government partnerships to assess the needs of the general population.⁵¹ Seeing the need to increase economic growth, deliver high quality social services, and improve governance, President Paul Kagame revitalized the imihigo system and applied it to government service delivery. Rather than drawing on an imported solution to increase accountability, imihigo had the advantage of being conceptually comprehensible to the general population due to its well-known pre-colonial roots.

Under this neo-imihigo system, the central government would form priorities, namely through strategic plans such as Vision 2020 and the Economic Development and Poverty Reduction Strategy, while local government leaders, such as appointed province governors and elected mayors, would be charged with devising local strategies to implement national priorities. The imihigo system involved decentralization of implementation, with the creation of multiple layers of input into both the goals and action plans of local districts. In 2006, the Government of Rwanda established district executive committees, chaired by the mayor of each of Rwanda's 30 districts. The district executive committees would draft goals in an imihigo document and an action plan, with formal approval required from elected community representatives. Imihigo goals include both routine functions, such as hiring staff and preparing budgets, in addition to community-based goals, such as equipping health centers, paving a certain number of roads, or building a certain number of schools.

⁴⁹ Shepard, et al – Controlled Study on HIV as a health systems strengthener or underminer – Am J Tropical Medicine 2012

⁵⁰ Price, et al. "Integrating HIV clinical services into primary health care in Rwanda: a measure of quantitative effects." AIDS Care Vol. 21, No 5 May 2009 608-14

⁵¹ Daniel Scher. "The Promise of Imihigo: Decentralized Service Delivery in Rwanda, 2006-2010." Innovations for Successful Societies Princeton University Press 2010.

The approved draft imihigo is then reviewed by representatives from the central government, who ensure that the draft imihigo aligns with central government priorities, is feasible, and fits within budgetary constraints. The final imihigo document is then signed by the district mayor with President of the Republic in a public ceremony, with the contents of the agreements broadcast on radio, television, and through word of mouth.

The imihigo system creates multiple points of accountability. Twice a year district mayors are required to submit a detailed report on the progress they are marking towards their imihigo targets. At the end of every year, two teams from the central government are assembled to review 15 districts, spending two days in each district. These teams review paperwork to identify discrepancies and spot check a previously unannounced selection of imihigo targets. From this review, the teams grade and rank the districts. Reports find that the ranking of districts has not only created an easily comprehensible metric that informs communities of their leaders' performance, but also fosters a sense of competition among district leaders.⁵²

The imihigo system functions to formalize and institutionalize planning at all levels of government and even among non-governmental factions. Interestingly, all NGO partners are required to sign imihigo contracts with the President as well to ensure that all implementing partners adequately plan to achieve progress and are held accountable for their pledges. Reports from mayors indicate that imihigo has made them feel as if they are being monitored by the central government, and thus must deliver results or else risk losing their governmental post.⁵³ By creating a robust system of accountability from the central government level down to the district, the imihigo system helps ensure the actualization of national priorities that are well-calibrated towards local needs.

Performance-Based Financing

Prior to the large influx of donor funding, the Government of Rwanda, alongside NGO partners, decided to begin exploring strategies to improve efficiency and service output in the health sector. There was wide variation in outcomes among health centers within the public sector, leading policymakers to believe that interventions aimed at improving health worker motivation, on top of providing adequate medical equipment and ensuring a stable drug supply, could improve the quantity and quality of services delivered.⁵⁴ In 2001 and 2002, the Government of Rwanda partnered with two different NGOs to experiment with a performance-based financing (PBF) system,⁵⁵ meaning a system in which payments to health workers was directly linked with their ability to induce improvements in service uptake.

Prior to the pilot studies, health workers in Rwanda has been compensated through a combination of standard baseline salaries, facility income derived from user fees, and a flat bonus payment regardless of job performance.⁵⁶ The reforms, which began to be implemented throughout the country in 2006, altered the bonus payment system in two ways: 1) bonuses were distributed to entire health facilities based on the facility's performance, with decisions about apportionment of

⁵² *ibid*

⁵³ Sekabaraga, Diop, Soucat. "Can innovative health financing policies increase access to MDG-related services? Evidence from Rwanda." *Health Policy and Planning* 2011, 26, pg 52-62

⁵⁴ B Meessen, L Musango, JP Kashala *et al.* Reviewing institutions of rural health centres: the Performance Initiative in Butare, Rwanda *Tropical Medicine & International Health*, 11 (8) (2006), pp. 1303–1317

⁵⁵ Meesen 2006; Soeters, Habineza, Peerenboom. "Performance-based financing and changing the district health system: experience from Rwanda." *Bulletin of WHO* 2006

⁵⁶ Meesen Reviewing institutions of rural health centres: the Performance Initiative in Butare, Rwanda 2006

bonuses left to the individual facility and 2) flat-bonus payments were replaced with payments that were tied to certain health output indicators.⁵⁷

The implementation of performance-based incentives can be undermined in a number of ways at the health center level, including deprioritizing the provision of uncompensated or undercompensated health services or the misreporting of data in an attempt to “game” the system for increased health facility funding.⁵⁸ In order to ensure accuracy in data collection and reporting, the Ministry of Health established district steering committees that consist of members from government, providers, and civil society.⁵⁹ The steering committee verifies data that is submitted to them on a monthly basis by health facilities through sending auditors to facilities on unannounced, random days to cross-check reported data with actual utilization and facility registries.⁶⁰ The Ministry of Health verified the accuracy of its steering committee system during the PBF scale-up period by conducting face-to-face interviews with nearly 1000 patients, finding that less than 5% of reporting on services or patients was falsified.⁶¹ Indeed, the steering committee is able to enforce proper data collection through its mandate to impose sanctions on health facilities that are found to have misreported data, including docking payments.

Using costing analyses from available budgets, the determination of health priorities, and experiences of previous NGO pilot projects, the Ministry of Health sets rates for compensating health facilities on a fee for service basis for a number of services, including PBF payments for the number new adults and infants on ARV treatment, the number of HIV + pregnant mothers put on ARVs during labor, and the number HIV patients who receive a CD4 test.⁶²

Two randomized-controlled trials were designed to evaluate the impact of PBF on health service provision as the policy was implemented in phases throughout the country. These studies isolated the resource effect from the incentive effect of PBF by providing control sites with increased budgetary support that was similar in magnitude to the increase in resources received by intervention sites through PBF. These studies found that PBF was responsible for a 23% increase in institutional deliveries, in addition to an increase in preventive health visits for children between 0-23 months and 24-59 months.⁶³ Another study found that the introduction of PBF accounted for an increase in

⁵⁷ Ministry of Health Rwanda (2008b) Performance-based financing guide for district hospitals. (Draft September 2008). MoH, Kigali.

⁵⁸ Eldridge 2009 and A Kalk, FP Amani, E Grabosch. “Paying for performance” in Rwanda: does it pay off? *Tropical Medicine & International Health*, 15 (2) (2010), pp. 182–190

⁵⁹ Ministry of Health. Contractual Approach Unit, Republic of Rwanda. (2006) *Guide for Performance Based Financing. Training module for actors involved in the implementation of the PBF program*. Kigali: Rwanda.

⁶⁰ Fritsche, György, Louis Rusa, Rigobert mpendwanzi, Agnes Soucat, Claude Sekabaranga, Bruno Meesen (2010), “The National Rollout of Performance-Based Financing for Health Services in Rwanda: How It Was Done,” World Bank Working Paper.

⁶¹ Health, Development and Performance (HDP) (2008), “Rapport d’ Enquête de Contre-Vérification par la Communauté dans les Districts de Nyamasheke, Nyaruguru et Rulindo,” Kigali, Rwanda, online:

http://www.pbfrwanda.org.rw/index.php?option=com_docman&task=cat_view&gid=24&Itemid=29&limitstart=35

⁶² Ministère de la Santé République du Rwanda. Guide de l’Approche Contractuelle. Modules de Formation des Acteurs Concernés pour le Démarrage PBF dans Rwanda. 2006.

⁶³ Basinga P, Gertler PJ, Binagwaho A, Soucat AL, Sturdy J, Vermeersch CM. Effect on maternal and child health services in Rwanda of payment to primary health-care providers for performance: An impact evaluation. *The Lancet* 2011; 377(9775); 1421-1428.

HIV/AIDS testing at health centers, especially among couples.⁶⁴ Qualitative studies have unpacked the ways in which PBF has potentially changed behavior among health workers, with anecdotal reports that PBF has encouraged innovation within districts, with some health institutions distributing cash transfers and gifts to pregnant mothers to ensure their delivery at a health facility.⁶⁵ Other surveys of health workers reveal that for some PBF helped improve staff motivation, increased performance, regularized documentation, and decreased absenteeism.⁶⁶ The combination of imihigo and performance-based contracting in the health system has created a culture of accountability, in which compensation and prestige is linked to actual performance.

2. Accessibility

One of the key elements in the scale-up of HIV coverage was the ability of the Government of Rwanda to substantively increase the number of people who came into contact with the health system. This meant making the health system economically within reach of patients and geographically accessible. It also meant explicitly taking advantage of non-HIV related health needs to create greater entry-points into the health system.

Improving Economic Accessibility

Though health care was free at the point of delivery for two years following the genocide, by 1996 budgetary pressure and weak donor support prompted the Government of Rwanda to begin charging patients for utilizing health services, also known as user fees. User fees in sub-Saharan Africa had been promoted as a policy instrument by institutions such as the World Bank, which had argued that user fees would generate revenue for health services, increase the efficiency of services by reducing overconsumption, and subsidize rural health care with revenue collected from urban health centers.⁶⁷ However user fees in many sub-Saharan African countries proved to promote underconsumption of health services, as they made care financially inaccessible for large portions of the population.⁶⁸ Low availability of governmental funding for health services meant that user fees generated between 60-80% of health centres revenues in Rwanda.⁶⁹

⁶⁴ De Walque, et al. Using Provider Performance Incentives to Increase HIV Testing and Counseling Services in Rwanda. Working Paper CEGA 2013

⁶⁵ Sekabaraga, Diop, Soucat. "Can innovative health financing policies increase access to MDG-related services? Evidence from Rwanda." *Health Policy and Planning* 2011, 26, pg 52-62

⁶⁶ A Kalk, FP Amani, E Grabosch. "Paying for performance" in Rwanda: does it pay off? *Tropical Medicine & International Health*, 15 (2) (2010), pp. 182–190

⁶⁷ John S. Akin, Nancy Birdsall, and David M. de Ferranti, *Financing Health Services in Developing Countries*, 1987
World Bank Policy Study (Washington D.C.: World Bank, 1987).

⁶⁸ see See Barbara McPake, "User Charges for Health Services in Developing Countries: A Review of the Economic Literature," *Social Science and Medicine* 36, no. 11 (1993): 1404.; Rob Yates, "International Experiences in Removing User Fees for

Health Services— Implications for Mozambique," report prepared for Department for International Development, Health Resource Centre, London, June 2006, 3– 13; Jessica Cohen and Pascaline Dupas, "Free Distribution or Cost-Sharing?

Evidence from a Randomized Malaria Prevention Experiment," *Quarterly Journal of Economics* 125, no. 1 (2010), www.povertyactionlab.org/publication/free-distribution-or-cost-sharing-evidence-malaria-prevention-experiment-kenya-qje (accessed August 24, 2012).

⁶⁹ Soeters R, Habineza C, Peerenboom P. Performance based financing and changing the district health system: experience from Rwanda. *Bull World Health Organ* 2006; **84**: 884–89.

Evidence from Rwanda suggested that user fees placed a large financial burden on patients, leading to underconsumption of health care. Health policy makers witnessed a decline of 0.3 to 0.25 visits per capita to health facilities between 1997 and 1999.⁷⁰ The inaccessibility of health services to the poor, HIV prevalence, and rising poverty rates worried policymakers, who decided to test a pre-payment, community based mutual insurance scheme in three districts in Rwanda as an alternative to user fees.⁷¹ The pilot phase, involving 54 health centers, yielded positive results, such as higher health care utilization rates and decreases in out-of-pocket spending for insurance members, in addition to improved equity of health service use.⁷² These results led to the gradual expansion of community-based insurance, or Mutuelles de Sante, throughout the country, with country-wide standardization of payment rates and benefits in 2007. Beginning in 2007, health centers were required to provide a minimum service package (PMA) and district hospitals required to provide a complementary service package (PCA) that are covered by mutuelles.⁷³ Referral care is financed through mutuelle contributions and a pooling of funding at the district and national level from government, donor, and NGO contributions.

The cost of mutuelles in 2007 was about 1000 RWF per person, in addition to 10% copayments at the point of care for certain services. Though many services, including bed nets, vaccinations, TB and HIV treatment, are fully covered by mutuelles, services not covered by mutuelles were prohibitively expensive for the poorest Rwandans.⁷⁴ In response, the Government of Rwanda, in collaboration with the Global Fund to Fight AIDS, TB, and Malaria as well as NGOs, fully subsidized annual mutuelle payments and copayments for the poorest 16% of the population beginning in 2006, in addition to offering completely free enrolment to genocide survivors.⁷⁵ In response to criticism regarding the disproportionate burden placed on the poor by charging a flat mutuelle premium,⁷⁶ in 2011 Rwanda introduced a tiered contribution system based on income levels, or ubudehe categories, assessed at the community level. As of June 2012, 90.6% of Rwandans were enrolled in mutuelle, with another 7% covered by civil service, military, or private insurance.⁷⁷

Evaluations of the mutuelle system find that its expansion has brought more people into contact with the health system. In a retrospective comparative study of the first eight years of mutuelle, a recent study found that children were more likely to utilize medical care for diarrhea, women were more likely to utilize skilled birth attendants, and that the odds of using medical care increased by 2

⁷⁰ Schneider, P. (2005). Trust in micro-health insurance: an exploratory study in Rwanda. *Social Science & Medicine*, 61:1430-1438.

⁷¹ Scheider, P., and F. Diop (2001). Impact of prepayment pilot on health care utilization and financing in Rwanda: findings from final household survey. Bethesda, MD: Abt Associates Inc.

⁷² *Ibid*, Diop F, Leighton C, Butera D. Washington, DC: Health Financing Task Force; 2007. Health financing task force discussion paper: policy crossroads for mutuelles and health financing in Rwanda, Schneider P, Hanson K The impact of micro health insurance on Rwandan health centre costs. *Health Policy Plan*. 2007 Jan; 22(1):40-8

⁷³ Antunes AF, Saksena P, Elovainio R, Mathauer I, Kirigia J, et al. (2009) Health Financing Systems Review of Rwanda: Options for universal coverage. Geneva: World Health Organization and Republic of Rwanda Ministry of Health.

⁷⁴ Farmer 2013

⁷⁵ Kalk A, Groos N, Karasi JC, Girrbaach E (2010) Health systems strengthening through insurance subsidies: the GFATM experience in Rwanda. *Tropical Medicine & International Health* 15: 94–97.

⁷⁶ Jean-Olivier Schmidt , Jean K. Mayindo and Andreas Kalk. 2006 “Thresholds for health insurance in Rwanda: who should pay how much?” *Tropical medicine and international health* 2006

⁷⁷ Andrew Makaka, Sarah Breen, Agnes Binagwaho, Universal health coverage in Rwanda: a report of innovations to increase enrolment in community-based health insurance, *The Lancet*, Volume 380, Supplement 2, 21 October 2012, Page S7

for mutuelle members compared to uninsured households. Further, the probability of using health care was significantly higher and the probability of experiencing catastrophic health expenditure lower for insured versus uninsured households across all income quintiles.⁷⁸ This is consistent with other studies that found a general increase in the total number of outpatient visits between 2002 and 2007, and specifically increased health utilization and decreased spending per illness among insured households compared to uninsured households in the event of illness.⁷⁹⁻⁸⁰ In comparison to user fees, mutuelles made health care in Rwanda more economically accessible at the point of care compared to user fees, allowing for more people to come into contact with health centers and district hospitals. Financial challenges remain, however, and are still a barrier to accessing care for a large proportion of Rwandans.⁸¹ Though the percentage of women reporting at least one problem accessing health care has dropped from 80.8% in 2005 to 61.4% in 2010, nearly 53% of women surveyed in 2010 who reported facing a barrier to accessing care cited lack of money for treatment as the primary obstacle.⁸²

Expanding Geographic Reach

Another “hidden” health care fee in many developing countries is the cost of transport to the health center, which can also be prohibitively expensive for the poor, especially in rural and remote areas where transport is scarce.⁸³ In order to surmount this barrier to accessing health services, the Government of Rwanda began to make HIV treatment available at a broad range of health facilities, ranging from large referral hospitals to the smallest unit, the health center. Through a combination of contracting health facilities owned by religious organizations, renovating existing health facilities, and building new facilities using donor money from sources such as the World Bank’s MAP program, the GFTAM, and PEPFAR, the Government of Rwanda was able to make ARV treatment more geographically widespread. By 2012, 97% of all health facilities offered voluntary counseling and testing services; 97% of all health facilities offered PMTCT services; and 89% of all health facilities offered antiretroviral treatment.⁸⁴ In representative demographic surveys conducted in 2005 and 2010, the percentage of women who cited distance to a health facility as a barrier to access dropped from 40% in 2005 to 26% in 2010, indicating that geographic accessibility has indeed improved among patients utilizing health services.

In coordination with expanding ART availability to health centers, measures were also taken to train nurses to independently initiate patients onto first line treatment at the health center level. A pilot study conducted between 2005 to 2008 demonstrated that nurses who were mandated to order CD4 tests, assess ART eligibility, order lab tests, and initiate ART could achieve high patient retention and improved immunological outcomes that were similar to levels achieved by doctor-centered ART

⁷⁸ Lu, et al. “Towards Universal Health Coverage: An evaluation of the Rwanda Mutuelles in its First Eight Years. PLoS Medicine June 2012.

⁷⁹ Sekabaraga, Diop, Soucat. “Can innovative health financing policies increase access to MDG-related services? Evidence from Rwanda.” Health Policy and Planning 2011, 26, pg 52-62

⁸⁰ Saksena, et al. Mutual Health Insurance in Rwanda: Evidence of financial risk protection

⁸¹ RS Dhillon, MH Bonds, M Fraden *et al.* The impact of reducing financial barriers on utilisation of a primary health care facility in Rwanda. Global Public Health (2011), pp. 1–16

⁸² Rwanda DHS 2010 pg 122

⁸³ PEF Textbook, Chapter 6, page 133 Building an Effective Rural Health Delivery Model in Haiti and Rwanda, Paul Farmer, *Infections and Inequalities: The Modern Plagues* (Berkeley: University of California Press, 1999).

⁸⁴ RBC National HIV Report 2012-2013 (forthcoming)

initiation programs.⁸⁵ Though the study lacked a control group for comparison, the high levels of retention and improvements in CD4 counts were enough to compel the government to scale up shifting ART initiation from physicians to trained nurses. In 2010 the Government of Rwanda completed a three week training course of a cadre of 500 nurses to equip them to initiate patients onto ART, with support being provided by physicians at the district level for more complicated cases.⁸⁶ Through supplying smaller health centers with ART, in addition to staffing these centers with health workers capable of initiating patients onto treatment, the Government of Rwanda was able to substantially improve the geographical availability of ART by bringing treatments closer to home.

In addition to decentralizing care through task shifting, the Government of Rwanda has also expanded the geographic reach for its health interventions by retaining a workforce of 45,000 community health workers (CHWs), who are elected by their communities and are compensated through governmental start-up investments in income-generating projects, such as animal rearing, crop farming, and enterprises.⁸⁷ CHWs are trained to diagnose and empirically treat malaria, pneumonia, and diarrheal diseases, and additionally can refer patients to health centers and hospitals for antenatal care services, family planning, and childhood immunizations.⁸⁸

In addition to improving the quality of health interventions, CHWs have also been critical in bringing more people into contact with the health system, including HIV-related services. Rwanda has innovatively implemented a couple testing program in which both fathers and mothers are encouraged to test for HIV during antenatal care visits. By encouraging mothers and fathers to be involved in antenatal care services, CHWs play an important role in providing more entry points for PLWHA into the health system. Through placing serodiscordant couples on treatment, the Government of Rwanda hopes to halt the transmission of new infections. Indeed, over the course of eight years Rwanda has gone from 26.4% of male uptake of antenatal testing for HIV to 84.5%.⁸⁹ Through expansions of both its physical and human resource health infrastructure, Rwanda has brought care closer to patients' homes, thereby increasing health intervention uptake and reducing the financial burden placed on patients to access preventive and curative care.

⁸⁵ Shumbusho, et al – Task Shifting for HIV care – Evaluation of Rural Rwandan Nurses – Plos 2009

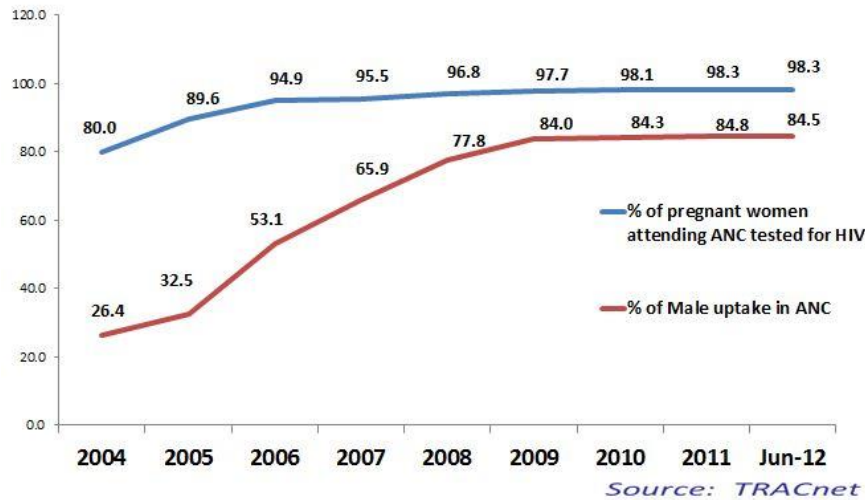
⁸⁶ Rwanda Annual Report on HIV and AIDS, 2010-2011 1. 2011;2010–1.

⁸⁷ National HIV/AIDS Report 2011-12

⁸⁸ Farmer BMJ

⁸⁹ Mbabazi J et al. Prevention with positive interventions in the Rwanda National HIV Program, 2011. 19th International AIDS Conference, Washington, DC, 22–27 July 2012 (Abstract THPE238; <http://www.iasociety.org/Abstracts/A200745000>, accessed 3 June 2013).

Trends in pregnant women and male partner HIV testing in ANC/PMTCT, 2004-2012



3. Efficient Use of Funding For Health System Strengthening

Donor Coordination

The proliferation of donors, non-profit organizations, and for-profit enterprises in the provision of health services in many developing countries is well known.⁹⁰ The multitude of partnerships with non-governmental organizations and international donors brings with it increased funding in contexts of weak government capacity, but has the potential for the creation of parallel systems, duplication of efforts, lack of coordination, and a further undermining of government capacity. The number of organizations operating in a country is not directly related to the number of people on treatment. Indeed, the head of the National AIDS Control Commission of Rwanda pointed out that in 2005 there were more than 150 AIDS-related NGOs in Rwanda yet fewer than 150 people on AIDS therapy outside the capital city of Kigali.⁹¹

From the beginning of the global wave of resources to treat HIV/AIDS, the Government of Rwanda has coordinated both donors and implementing partners with the strategic objective of building a coherent health system without being undermined by the creation of parallel systems. It also drew on the experiences of implementing partners to test the feasibility of policy instruments, including performance-based financing,⁹² mutuelle health insurance,⁹³ and community health workers.⁹⁴

⁹⁰ Paul Farmer textbook – Building a Rural Health delivery model pg 169

⁹¹ Paul Farmer global health textbook Preface pg xix

⁹² B Meessen, L Musango, JP Kashala *et al.* Reviewing institutions of rural health centres: the Performance Initiative Butare, Rwanda Tropical Medicine & International Health, 11 (8) (2006), pp. 1303–1317

⁹³ Scheider, P., and F. Diop (2001). Impact of prepayment pilot on health care utilization and financing in Rwanda: findings from final household survey. Bethesda, MD: Abt Associates Inc.

⁹⁴ Rich, et al 2012. “Excellent Clinical Outcomes and High Retention in Care Among Adults in a community-based HIV treatment program in Rural Rwanda.” JAIDS Vol 59, No 3 March 1, 2012

Beginning in 2006 the Government of Rwanda, along with the World Bank, began to integrate all donor funds into a single fiscal framework, called a compact agreement.⁹⁵ This agreement takes place alongside an annual development partners meeting in which the government presents its achievements and simultaneously coordinates major donors for future policy plans.⁹⁶ The government of Rwanda also oversees the activities of non-governmental implementing partners and ensures that their activities fit within a single national strategic health plan, which involves a single set of protocols, guidelines, and monitoring and evaluation frameworks. NGOs must register with the government and present a workplan for approval. NGOs are also subject to signing imihigo, or performance-based contracts, which must be reviewed before NGOs can continue to operate in country the following year. In some cases the Government of Rwanda has asked non-governmental organizations that are not aligned with the government's strategic plan to leave the country.⁹⁷ Through vigorously enforced coordination mechanisms between donors, implementing partners, and the government, Rwanda has been largely able to avoid verticalization of disease treatment and a fragmentation of service delivery efforts.

Integration of Services

From the beginning of the influx of disease-specific, or “vertical,” funding from donors such as the Global Fund and PEPFAR, Rwanda used new resources to rebuild the country's health infrastructure and create a platform for the provision of integrated primary healthcare., avoiding the creation of parallel delivery systems.⁹⁸ Some donors, particularly the Global Fund, were more willing to allow resources to be spent on non-target diseases, such as setting up trainings for community health workers and financing salary-top ups for rural physicians to improve retention. Such investments in human resources had the added benefit of benefitting the general population, as physicians and community health workers were equipped to treat patients suffering from diseases other than AIDS, TB, and malaria as well. Rwandan policymakers were also successfully able to negotiate using HIV-specific funding to build and equip delivery rooms, purchase ambulances, create laboratories, and increase the number of x-ray machines by arguing that people suffering from HIV, TB, and malaria required all of these services. Evidence also shows that TB and HIV activities were integrated, with a high proportion of TB patients receiving HIV testing and care.⁹⁹ The Government of Rwanda has also used the scale-up of HIV-service provision to provide more points of entry for integrated, comprehensive care for children, with evidence suggesting that this has contributed to decreases in under-5 mortality.¹⁰⁰ Innovatively, the health infrastructure financed through disease-specific funds can be used by the health system to service the needs of the general population as well, generating efficiencies in the use of donor health funding.¹⁰¹

⁹⁵ Logie, et al.

⁹⁶ *Ibid*

⁹⁷ Porter, et al. *Partners in Health: HIV care in Rwanda*. Harvard Business School Case 709474. Harvard Business School Press, 2009.

⁹⁸ Price, et al. “Integrating HIV clinical services into primary health care in Rwanda: a measure of quantitative effects.” *AIDS Care* Vol. 21, No 5 May 2009 608-14

⁹⁹ Pevzner, et al. Evaluation of the Rapid Scale-up of Collaborative TB/HIV Activities in TB Facilities in Rwanda, 2005-2009. *BMC Public Health* 2011, 11:550

¹⁰⁰ Gupta, et al. Clinical Outcomes of a Comprehensive Integrated Program for HIV-exposed Infants: A 3-year Experience Promoting HIV-Free Survival in Rural Rwanda. *JAIDS* 2013, e109-114

¹⁰¹ Mukherjee JS, Jerome JG, Sullivan E, May MA, Mayfield A, Lambert W, Dhavan N, Carney N, Rhatigan J, Ivers LC. Rwanda: Impact of Global Health Initiatives on the health system: a mixed methods analysis. in *Interactions Between Global Health Initiatives and Health Systems: Evidence from Countries*. Maximizing Positive Synergies Academic Consortium June 2009.

In addition to efficiently using donor funding at the district level, the Government of Rwanda has also strategically used donor funding to strengthen the health system at the central level, namely through creating a reliable and safe drug supply chain system and improving the national laboratory capacity. Rwanda has increased the capacity of the Rwanda Drug, Consumables, and Equipment Central Procurement Agency (CAMERWA) as a single procurement source for publicly stocked medicines, including antiretrovirals. ART sites regularly submit their forecasted medicine needs to through the National Quantification Committee, which approves the total quantities of medicines needed and splits the cost among all participating donors. Medicines are then distributed in a single system called the coordinated procurement distribution system (CPDS), which is supported by multiple partners including the Global Fund, PEPFAR, Clinton Foundation, UNICEF, and SCMS (supply chain management system). Support for CAMERWA has had positive spillovers into other health priorities, since the same platform is used to distribute other essential medicines to public health facilities. It has also notably reduced the establishment of parallel drug systems by centralizing procurement efforts. The establishment of a rationalized supply chain has also assisted Rwanda in systematically ensuring that safe and effective medicines are purchased, with a recent study confirming that TB drugs tested in Rwanda contained no fake medicines, compared to 16.6% of TB drugs sampled in other African countries.¹⁰²

Recently, the Government of Rwanda became one of the only countries to receive PEPFAR funds as direct budgetary support, which is being used for an innovative seven year human resources in health program that brings health professionals from fourteen academic medical centers, six schools of nursing, one school of public health, and two nursing schools to build a sustainable medical education system in Rwanda.¹⁰³ As a result, significant donor health funding has shifted from non-governmental implementing partners towards the Rwandan government in recent years, further improving country ownership and sustainability. In the coming years the Government of Rwanda hopes strategically invest donor and government resources to enlarge the size of its health workforce, thereby expanding the capacity of the health system to tackle multiple diseases within a unified health system. Indeed, as donor funding continues to wane, the Government of Rwanda must continue its deliberate investments in interventions that can sustain the health gains made since the genocide.

¹⁰² Attaran, Binagwaho PLoS 2013

¹⁰³ HRH NEJM article 2013