

Are country reputations for good and bad leadership on AIDS deserved? An exploratory quantitative analysis

Nicoli Nattrass

AIDS and Society Research Unit, University of Cape Town, Rondebosch, 7701 Cape Town, South Africa
Address correspondence to Nicoli Nattrass, E-mail: nicoli.nattrass@gmail.com

ABSTRACT

Some countries (e.g. Brazil) have good reputations on AIDS policy, whereas others, (notably South Africa) have been criticized for inadequate leadership. Cross-country regression analysis reveals that these 'poster children' for AIDS leadership have indeed performed better or worse than expected given their economic and institutional constraints and the demographic and health challenges facing them. Regressions were run on HAART coverage (number on highly active antiretroviral therapy as percentage of total need) and MTCTP coverage (pregnant HIV+ women accessing mother-to-child-transmission prevention services as percentage of total need). Brazil, Cambodia, Thailand and Uganda (all of whom have established reputations for good leadership on AIDS performed consistently better than expected—as did Burkina-Faso, Suriname, Paraguay Costa Rica, Mali and Namibia. South Africa, which has the worst reputation for AIDS leadership, performed significantly below expectations—as did Uruguay and Trinidad and Tobago. The paper thus confirms much of the conventional wisdom on AIDS leadership at country level and suggests new areas for research.

Keywords geography, health services, socioeconomics factors

Introduction

The acquired immunodeficiency syndrome (AIDS) remains a major challenge for global health. Despite an unprecedented mobilization of resources since 2003 (notably the Global Fund to fight AIDS, tuberculosis and malaria and the US President's Emergency Plan for AIDS Relief (PEPFAR)), the epidemic continues to outstrip attempts to rein it in. In 2007, 2.1 million people died of AIDS and 2.5 million became infected with the human immunodeficiency virus (HIV) bringing the global total living with HIV to an estimated 33.2 million.¹

Part of the problem is that as foreign assistance flows into AIDS-affected countries, inadequacies at the national level have become apparent. This has placed the spotlight on government 'leadership' on AIDS.^{1–5} Some countries, notably Brazil, Botswana, Cambodia, Thailand and Mexico have established good reputations for promoting condoms and access to antiretrovirals for mother-to-child-transmission prevention (MTCTP) and highly active antiretroviral therapy (HAART).^{6–13} By contrast, South Africa is infamous for President Mbeki's support for AIDS denialism and suspicion towards antiretrovirals,¹⁴ Russia and Ukraine have reputations for stigmatizing injecting drug users, and China and Zimbabwe for human rights abuses.^{3–5} Other countries

have more contested reputations. For example, Uganda's President Museveni is widely acclaimed for raising awareness about HIV,^{15–17} but the country's image has been harmed by the cancellation of a Global Fund loan and reports of inefficiencies and confusion in AIDS prevention and treatment interventions.^{3,5,17,18} Cuba, having initially been criticized for confining HIV-positive people to sanatoria,¹⁹ is now seen as a role model for providing HAART²⁰ and MTCTP.²¹ Countries with growing reputations on AIDS leadership include, Rwanda, Haiti, Malawi and Namibia.^{1,5}

But are these reputations for (good or bad) AIDS leadership deserved, or do they simply reflect differential capacities and constraints? For example, when a newspaper article blamed South Africa's reluctance to roll out HAART on Mbeki's AIDS denialism,²² the South African ambassador responded by pointing to the growing public sector HAART rollout.²³ Given that South Africa has the largest HAART program in the world (a point Mbeki himself likes to make)²⁴ and faces real economic and institutional

Nicoli Nattrass, Professor of Economics and Director of the AIDS and Society Research Unit at the University of Cape Town and Visiting Researcher in the Health Economics and HIV/AIDS Research Division at the University of Kwa-Zulu Natal

constraints,²⁵ is it really appropriate to argue that South Africa's leadership has been inadequate?

A potentially useful way to approach this is to frame the question of leadership explicitly within the context of what was possible and reasonable to expect. This paper accordingly uses cross-country regression analysis of HAART coverage (i.e. the number of people on HAART as a percentage of those estimated to need it) to explore which countries demonstrate relatively good or bad outcomes given the challenges and opportunities open to them, and in light of international standards set by performance in other countries. HAART coverage, of course, only captures one aspect of AIDS policy—but it has the advantage of being the most widely reported outcome variable available. MTCTP coverage is also explored, but to a more limited extent as these data are less reliable and are available for fewer countries. The analysis was conducted on 82 AIDS-affected developing and transitional countries. Data were sourced from UNAIDS, the WHO and the World Bank.

Methods

Regression analysis on HAART coverage is employed to account for the impact of socio-economic and institutional factors beyond the control of governments. The regression residual (the difference between actual and predicted HAART coverage) thus indicates which countries are performing better or worse than expected given these factors.^{26–28} Countries demonstrating good leadership on AIDS would be expected to have high positive residuals (and vice versa for those with reputations for bad leadership). However, as the residual picks up the influence of all omitted variables, country performance assessments were made only on the basis of consistently large residuals. The decision rule was to classify only those countries with residuals consistently >15 (i.e. actual HAART coverage exceeds predicted coverage by 15 percentage points) as performing above expectations. Those with residuals consistently between –15 and 15 were classified as performing 'as expected' and those with residuals below –15, as performing 'below expectations'. Residuals were generated using three different plausible regression specifications. These are presented in Table 1 along with residuals for selected countries. Fig. 2 shows the residuals for all countries.

The key economic indicator of domestic capacity to roll out HAART is *per capita* income, i.e. the level of economic development. As can be seen in Fig. 2, there is a positive (but weak) relationship between *per capita* income and the level of HAART coverage. Countries above the regression line are doing better in terms of HAART coverage than would be expected if *per capita* income was the only factor

driving HAART coverage (and *vice versa* for those below the line). The recognized poor performers (e.g. Russia, Ukraine and South Africa) fall substantially below the line (suggesting that they should have achieved higher levels of coverage given their level of development), and the poster children for good performance (Cambodia, Cuba, Brazil, Botswana, Malawi, Namibia, Rwanda, Thailand, Uganda) fall substantially above it.

The level of development is a potentially important determinant of HAART coverage—but it is not the only one. It is thus necessary to run multivariate regressions taking into account a range of other country-specific characteristics which are likely to impact on HAART coverage and which are beyond the immediate control of governments. These are discussed below.

Some countries started rolling out HAART almost entirely on the basis of their own resources (notably Brazil and Cuba), but most were assisted to do so by significant external funding from donors. Although engaging constructively at national level with foreign donors is in itself a sign of good leadership (as is recognized to be the case in Rwanda and Botswana), foreign assistance to combat AIDS has been channeled through the Global Fund and PEPFAR to a wide variety of organizations and non governmental organisations as well as to different levels of government, not all of which are necessarily in agreement with national policy on AIDS. The impact of these additional resources thus should be taken into account—and is done so through the inclusion of dummy variables for whether a country is a PEPFAR focus country or not or was a recipient of a (first round) Global Fund grant or not.

Internal and external resources are crucial determinants of HAART coverage, but so too is the scale of the challenge facing governments. For this reason, both the (logged) total of HIV-positive population and adult HIV prevalence rates were included as controls—as was the (log of) the number of disability adjusted life years (DALYs) lost due to non-AIDS-related reasons. To take into account that it is easier to provide HAART to concentrated urban populations rather than scattered, poorly resourced rural populations, we also include the percentage of HIV-positive people living in urban areas as an explanatory variable. The percentage of births in the presence of skilled health professionals was included as an indicator of the reach of the health sector, and two political/institutional variables (political stability in 2005 and a dummy variable for whether a country is an established democracy or not) were included as proxies for broader governmental/institutional capacity.

Language fractionalization could be included on the grounds that providing HAART to many different language

Table 1 Regressions on HAART coverage and MTCTP coverage

| | <i>Log of HAART coverage: December 2006</i> | | | <i>Log of MTCTP coverage (2005)</i> |
|---|---|----------------------|---------------------|-------------------------------------|
| | 1 | 2 | 3 | 4 |
| Constant | 4.437 (2.961) | 1.938 (2.613) | 0.507 (2.080) | 1.978 (4.692) |
| (Log) GDP per capita (PPP) (2005) | 0.138 (0.208) | 0.461 (0.181) | 0.808 (0.171) | 0.675 (0.303) |
| PEPFAR focus country | 0.651 (0.209) | 0.229 (0.193) | 0.132 (0.211) | 0.810 (0.383) |
| Global Fund first round recipient | 0.010 (0.236) | 0.004 (0.234) | 0.018 (0.218) | 0.210 (0.304) |
| (Log) adult HIV prevalence (2005) | 0.218 (0.202)** | 0.170 (0.222***) | 0.070 (0.176*) | 0.600 (0.330)** |
| (Log) HIV+ population (2005) | 0.018 (0.070) | 0.005 (0.062) | 0.070 (0.052) | 0.025 (0.140) |
| Proportion of HIV+ people in urban areas | 0.164 (0.881)** | 0.234 (0.793**) | 0.894 (0.522*) | 0.922 (1.091)** |
| Political stability (2005) | 0.012 (0.107) | 0.016 (0.072) | 0.103 (0.105) | 0.049 (0.086) |
| Established democracy | 0.424 (0.483)** | 0.577 (0.438**) | 0.391 (0.062) | 0.593 (0.132)** |
| % of births with skilled health professionals | 0.020 (0.004) | 0.041 (0.001) | 0.781 (0.002) | 0.711 (0.026***) |
| (Log) non-AIDS DALYs per capita (2002) | 0.492 (-0.347) | 0.825 (-0.011) | 0.650 (-0.021) | 0.000 (-0.598) |
| Language fractionalization | 0.275 | 0.968 (-0.948***) | 0.932 (-0.643) | 0.216 |
| Latin America and the Caribbean | | 0.002 | 0.137 (0.982***) | |
| Southern Africa | | | 0.003 (0.265) | |
| West Africa | | | 0.534 (0.561***) | |
| | | | 0.009 | |

Continued

Table 1 Continued

| | Log of HAART coverage: December 2006 | | | Log of MTCTP coverage (2005) |
|--------------------------------|--------------------------------------|--------|------------------|------------------------------|
| | 1 | 2 | 3 | 4 |
| East Africa | | | 0.215 (0.389) | |
| | | | 0.583 | |
| <i>N</i> | 82 | 78 | 78 | 55 |
| Adjusted <i>R</i> ² | 0.5017 | 0.5697 | 0.6494 | 0.6097 |
| <i>F</i> | 7.86 | 9.99 | 10.74 | 11.75 |
| Prob > <i>F</i> | 0.000 | 0.000 | 0.000 | 0.000 |
| Botswana [#] | 0 | 0 | 7.8 | -50.2 |
| Brazil | 43.6 | 31.6 | 16.2 | 26.2 |
| Burkina-Faso | 27.1 | 27.7 | 24.3 | 3.2 |
| Cambodia | 59.3 | 48.5 | 60.4 | -0.7 |
| Cuba | 73.9 | | | |
| Gambia | -1.7 | 1.7 | -1.8 | 3.6 |
| Haiti | 14.6 | | | 3.6 |
| Latvia | -55.2 | -35.6 | -6.5 | |
| Malawi | 26.3 | 13.5 | 16.9 | 0.6 |
| Mexico | 56.2 | 52.6 | 38.5 | |
| Namibia | 18.6 | 24.9 | 25.1 | 1.0 |
| Paraguay | 42.0 | 48.3 | 35.4 | |
| Russia | -8.6 | -15.6 | -9.8 | 67.5 |
| Rwanda | 33.3 | | | 29.9 |
| South Africa | -36.1 | -24.1 | -42.6 | -39.0 |
| Thailand | 48.8 | 56.8 | 66.1 | |
| Uganda | 16.7 | 19.9 | 18.2 | 5.8 |
| Ukraine | -16.1 | -15.4 | -13.5 | 75.4 |
| Zambia | -9.0 | -1.2 | 6.8 | 3.0 |
| Zimbabwe | -8.0 | -10.3 | -6.2 | -7.9 |

GDP, gross domestic product.

Robust standard errors are in parentheses.

* $p < 0.100$, ** $p < 0.050$, *** $p < 0.001$.

[#]Regression models 1 and 2 actually predicted negative residuals for Botswana—indicating relatively poor performance. However, as Botswana already has 100% HAART coverage, this is an unreasonable imputation, and hence the residual was rounded up to 0. This was the only case for which a model predicted HAART coverage in excess of 100%.

groups poses additional costs and challenges. However, a negative relationship between language fractionalization and HAART coverage may reflect a policy choice not to provide HAART to certain groups rather than the degree of difficulty involved in providing HAART for all (E. Lieberman, in press). Hence, this variable is not included in the main regression but is added to regression 2 as part of the sensitivity analysis. Similarly, regional differences could be included on the grounds that they are necessary for capturing the impact of potentially relevant regionally specific cultural and epidemiological differences which may be relevant to a HAART rollout. However, this is a blunt instrument

for doing so. Furthermore, regional dummies may be picking up common patterns of AIDS leadership within regions (and if so, including regional dummies would be inappropriate for our purposes here). Thus, regional dummies were included only as part of the sensitivity analysis (regression 3) rather than in the main regression.

Results

Table 1 reports the results of three (robust) regression models. The main regression (regression 1) controls for level of development (gross domestic product *per capita*),

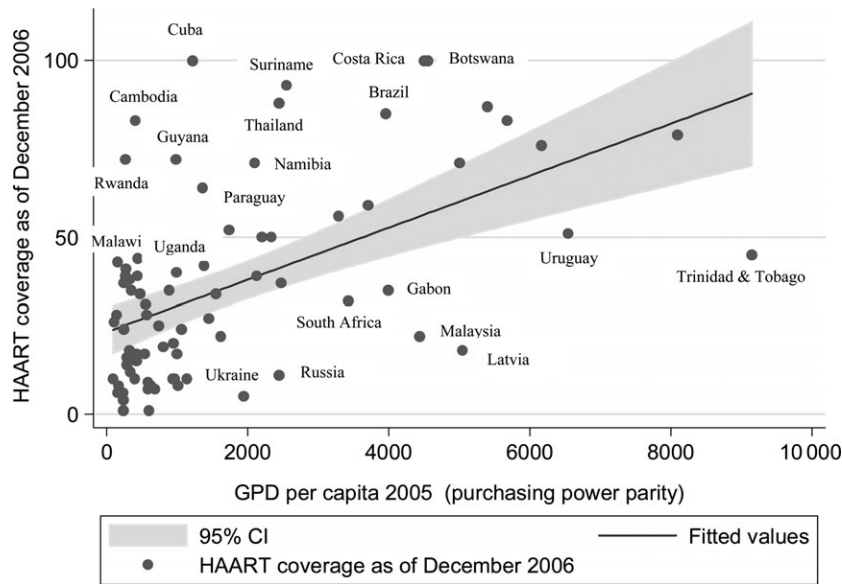


Fig. 1 HAART coverage and per capita income.

external support (being a PEPFAR country or in receipt of Global Fund first round funding), the scale of the epidemic (HIV prevalence, the absolute size of the HIV-positive population and its distribution between urban and rural areas), other health-related demands (non-AIDS DALYs *per capita*) and politico-institutional capacity (political stability, being an established democracy and percentage of births attended by skilled personnel). Four variables had statistically significant coefficients. The results indicate that

controlling for the other variables in the model, being a PEPFAR focus country raises HAART coverage by 67%; for every 1% increase in HIV prevalence, HAART coverage is predicted to rise by 0.2%; for every one percentage point increase in the share of the HIV-positive population in urban areas, HAART coverage rises by 2.5%; and being an established democracy raises HAART coverage by 55%. [Note that for unlogged variables, these results reflect the antilog of the coefficients reported in Table 1]

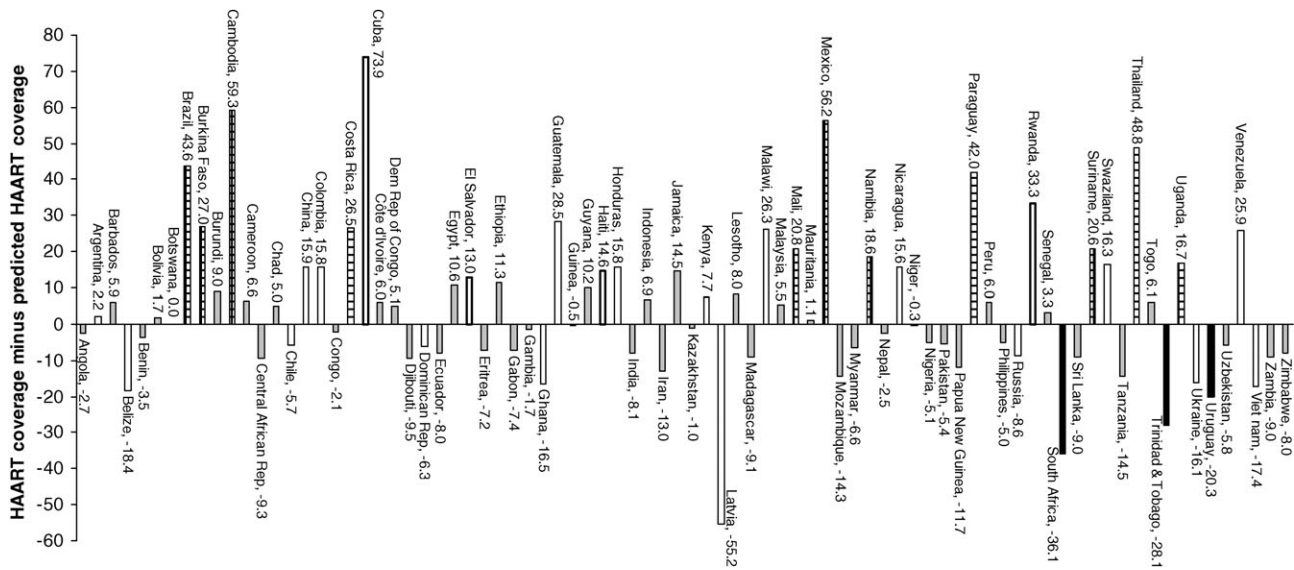


Fig. 2 Regression residuals for Regression 1. Black bars indicate scores of below -15 for all three regressions. Checked bars indicate scores of above 15 for all three regressions. Gray bars represent scores ≥ 15 and < 15 . White bars indicate that one of the regressions gave a different ranking to that of regression 1 (and those with darker borders indicate that missing data made it impossible to obtain predictions for these countries using regressions 2 and 3).

Adding language fractionalization to the model (regression 2) does not affect the sign or significance of the key variables much. It is significantly negatively correlated with HAART coverage (for every one percentage point increase in language fractionalization HAART coverage declines by 1.1%). Countries with diversified populations in terms of language thus do have smaller HAART rollouts but, as noted above, we cannot be sure whether this is the result of objective constraints or policy choices.

Adding a set of regional dummies (regression 3) renders the stable democracy variable insignificant, results in first round funding from the Global Fund becoming marginally significant but important (controlling for the other variables, being a recipient of first round funding from the Global Fund raises HAART coverage by 50%) and increases the overall explanatory power of the model. However, to what extent regional dummies are capturing objective contextual factors or are picking up policy stances which may be similar within regions, is unclear.

Table 1 reports the regression residuals for selected countries. Note that some country's residuals vary significantly across different specifications. For example, Brazil's actual HAART coverage exceeds its predicted coverage by a massive 43.6 percentage points using regression 1 but when language fractionalization is included, the residual falls to 31.6 (because Brazil is relatively homogenous in terms of language). When regional dummy variables are included as well (regression 3), Brazil's residual drops down to 16.2 because Latin American countries have higher HAART rollouts, and hence by including regional dummies, we are effectively holding Brazil to a higher standard simply because it is part of a region which has good HAART coverage.

Fig. 2 shows the residuals from regression 1 for all 82 countries. Brazil's result is reported in a checked pattern to indicate that all three specifications produced a residual of >15 (our cut-off point for a good performer). Ten other countries (Burkina-Faso, Cambodia, Costa Rica, Mali, Namibia, Suriname, Thailand, Paraguay and Uganda) also consistently obtained residuals of >15 . Four countries (Cuba, Haiti, El Salvador and Rwanda) have no predicted values for regressions 2 and 3 because of missing data on language fractionalization. If we consider the results for these countries from regression 1 to be definitive, then Cuba and Rwanda would also be classified as relatively good performers.

Out of the 82 AIDS-affected countries analyzed, 46 had residuals falling between -15 and 15 for all three regressions, and hence should probably be regarded as performing as expected (or at least as not performing

significantly worse or better than predicted). Their regression 1 residuals are represented as gray bars in Fig. 1. Eighteen countries in total had inconsistent classifications arising from different specifications. Their regression 1 residuals are depicted with a white bar. Three countries (South Africa, Uruguay and Trinidad and Tobago) had predicted residuals of below -15 for all three regressions and thus we can confidently conclude that they probably could (and should) have achieved higher levels of HAART coverage.

Table 1 also reports the results of a single regression (using the same explanatory variables as in regression 1) on (the log of) MTCTP coverage. As one would expect, MTCTP coverage is significantly (and substantially) positively associated with maternal health services (i.e. percentage of births attended by a skilled health professional). Like the HAART coverage regressions, it also varies significantly positively with the proportion of HIV-positive people in urban areas, with HIV prevalence and being an established democracy. However, unlike the HAART regressions, support from the Global Fund and PEPFAR were not significant determinants of MTCTP coverage. Note that as the MTCTP coverage data were available for only 55 out of the 82 countries, these preliminary results should be treated with caution.

Discussion

Main finding of this study

This study provides empirical support for much of the conventional wisdom about AIDS leadership at country level. Using HAART coverage as the key indicator of commitment to combating AIDS, the data show that Brazil, Cambodia, Mexico, Namibia, Thailand, Uganda and probably also Cuba and Rwanda have indeed performed better than expected given their institutional characteristics, demographic challenges and level of development. Their reputation as poster children for good AIDS leadership is thus probably well deserved. Botswana, which has universal HAART coverage, was assessed to be performing as expected—i.e. that universal coverage is the expected level of HAART coverage for a country with its relatively favorable characteristics. However, it is alarming that Botswana performed below expectations with regard to MTCTP coverage. More research is required to explore why Botswana is failing to achieve the levels of MTCTP coverage it should be reaching given its characteristics.

South Africa's reputation for poor AIDS leadership was strongly endorsed by the analysis. It suggests that South

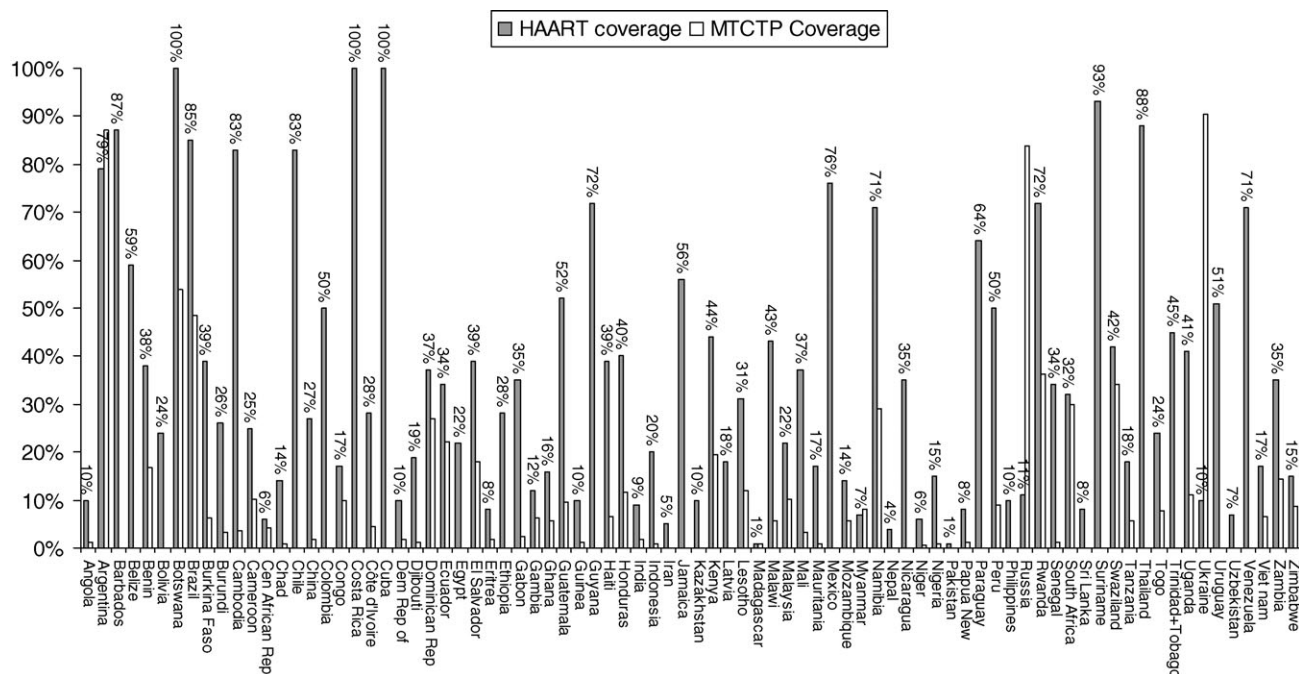


Fig. 3 HAART coverage and MTCTP coverage.

Africa had the resources and capacity to have achieved substantially higher levels of HAART coverage and MTCTP coverage (Fig. 3). This is consistent with the argument that it was probably ideological reasons which constrained the use of antiretrovirals for MTCTP or HAART rather than economic or institutional constraints. Other countries with reputations for poor leadership on AIDS (Russia, Ukraine, Gambia, Zimbabwe and Zambia) did not, however, meet our strict criteria for labeling a country as a poor performer (i.e. that all three regression residuals fall below -15). It is, however, interesting to note the vast discrepancy between Russia and Ukraine's relative performance on HAART and on MTCTP. The fact that both countries were able to perform relatively well with regard to MTCTP—but not with regard to HAART—suggests that the government was indeed more prepared to devote resources to the needs of pregnant HIV-positive women and their children than they were to assisting people with AIDS (most of whom were stigmatized injecting drug users).

Latvia performed substantially worse than expected using regressions 1 and 2, but not once regional dummies were included. This case is probably also worth looking into in more detail, especially given that the few reports on HAART provision in Latvia are broadly positive.²⁹ Further research would also be useful to those countries which performed significantly better than expected, but which do not have established reputations for good AIDS leadership (notably Mali, Burkina-Faso and Suriname). It is possible

that in the general discourse about AIDS leadership, insufficient attention has been paid to the leadership role that governments can play in facilitating the importation and distribution of generic antiretrovirals (as occurs in Burkina-Faso)³⁰ and in ensuring that the health system is well organized and efficient (as is the case in Suriname, but not in Trinidad and Tobago).^{31,32}

What is already known on this topic

As discussed in the introduction, some countries have established reputations for good or bad leadership on AIDS. These, however, are based on anecdotal evidence. There have been a few attempts to measure the impact of AIDS leadership, but these have been based on qualitative assessments of country performance and are limited in coverage.^{26,33}

What this study adds

This paper provides a systematic empirical analysis of the impact of AIDS leadership on HAART coverage using a large sample of 82 AIDS-affected countries. It builds on previous work using regression analysis to explore the role of political leadership on AIDS indirectly taking into account 'objective' constraints/opportunities facing governments.^{26–28} This methodology allows us to assess whether a country is performing significantly better or worse given its country characteristics—and hence whether its reputation for good or bad leadership on AIDS is deserved. The study

also reveals some countries without established reputations for AIDS leadership as relatively good (or bad) performers—thereby pointing to new areas for research.

Limitations of this study

The study is limited by the available international data. Also, by capturing political leadership indirectly (through the residual) the analysis is necessarily imprecise (that is why sensitivity analysis was conducted using several regression specifications and why wide bands were constructed for classifying countries). Note also that HAART coverage is but one indicator of the wide range of policy responses necessary for combating AIDS and tells us nothing about the characteristics of country-level programs which may have relevance for clinical outcomes and the development of drug resistance.

Funding

Funding for this work was provided by the Health Economics and HIV/AIDS Research Division at the University of Kwa-Zulu Natal and by AIDS2031.

References

- 1 UN Secretary General. *Declaration of Commitment on HIV/AIDS and Political Declaration on HIV/AIDS: Midway to the Millennium Development Goals: Report of the Secretary General, Sixty-second Session, Agenda Item 44, April 2008*. http://data.unaids.org/pub/Report/2008/20080429_sg_progress_report_en.pdf.
- 2 International Treatment Preparedness Coalition. *Missing the Target: A Report on HIV/AIDS Treatment Access from the Frontlines*, 2005. <http://www.aids-treatment-access.org/itpcfinal.pdf>.
- 3 International Treatment Preparedness Coalition. *Missing the Target #4: Time is Running Out to End AIDS: Treatment and Prevention for All*, July 2007. <http://www.aids-treatment-access.org/itpc4thfinal.pdf>.
- 4 International Treatment Preparedness Coalition. *Missing the Target #5: Improving AIDS Drug Access and Advancing Health Care for All*, December 2007. <http://www.aids-treatment-access.org/itpc5th.pdf>.
- 5 Global Fund. *Partners in Impact: Results Report*. The Global Fund, Geneva, December 2007. <http://80.80.227.97/en/files/about/replenishment/oslo/Progress%20Report.pdf>.
- 6 Barnett T, Whiteside A. *AIDS in the 21st Century: Disease and Globalisation*. New York: Palgrave Macmillan, 2002.
- 7 World Health Organisation. *Progress on Global Access to HIV Antiretroviral Therapy: An Update on '3 by 5'*. Geneva: WHO, 2005. <http://www.who.int/3by5>.
- 8 Ford N, Wilson D, Chaves G. *et al.* Sustaining access to antiretroviral therapy in the less-developed world: lessons from Brazil and Thailand. *AIDS* 2007;**21**(Suppl. 4):S21–S29.
- 9 Levi C, Vitória M. Fighting against AIDS: the Brazilian experience. *AIDS* 2002;**16**:2373–2383.
- 10 Saphonn V, Sopheab H, Pehn Sun L. *et al.* Current HIV/AIDS/STI epidemic: intervention programs in Cambodia, 1993–2003. *AIDS Educ Prev* 2004;**16**(Suppl. A):64–77.
- 11 Cohen J. Two hard-hit countries offer rare success stories: Thailand and Cambodia. *Science* 2003;**301**(5640):1658–1662.
- 12 Del Rio C, Sepúlveda J. AIDS in Mexico: lessons learned and implications for developing countries. *AIDS* 2002;**16**:1445–1457.
- 13 Bautista-Arredondo S, Mane A, Bertozzi S. Economic impact of antiretroviral therapy prescription decisions in the context of rapid scaling-up of access to treatment: lessons from Mexico. *AIDS* 2006;**20**:101–109.
- 14 Nattrass N. *Mortal Combat: AIDS Denialism and the Struggle for Antiretrovirals in South Africa*. Cambridge: Cambridge University Press, 2007.
- 15 Patterson A. *The Politics of AIDS in Africa*. Boulder: Lynne Rienner, 2006.
- 16 Parkhurst J, Lush L. The political environment of HIV: lessons from a comparison of Uganda and South Africa. *Soc Sci Med* 2004;**59**:1913–1924.
- 17 Epstein H. *The Invisible Cure: Africa, the West and the Fight against AIDS*. New York: Farrar, Straus and Giroux, 2007.
- 18 De Waal A. *AIDS and Power: Why there is no Political Crisis—Yet*. London: Zed Books, 2006.
- 19 Schepher-Hughes N. AIDS and the social body. *Soc Sci Med* 1994;**39**(7):991–1003.
- 20 Pérez J, Pérez D, Gonzalez I *et al.* *Approaches to the Management of HIV/AIDS in Cuba, WHO Perspectives and Practice in Antiretroviral Treatment*. Geneva: WHO, 2004. Available at: http://whqlibdoc.who.int/publications/2004/9241592060_eng.pdf.
- 21 Castro A, Khawja Y, Gonzalez-Nunez Y. Sexuality, reproduction and HIV in women: the impact of antiretroviral therapy in elective pregnancies in Cuba. *AIDS* 2007;**21**(Suppl. 5):S49–S54.
- 22 Moore J, Nattrass N. Deadly quackery. *New York Times*, 4 June 2006.
- 23 Masekela B. South Africa and AIDS. *New York Times*, 11 June 2006.
- 24 Mbeki T. State of the Nation Address, 2006. Available on <http://www.anc.org.za/ancdocs/history/mbeki/2006/tm0203.html>.
- 25 Butler A. South Africa's AIDS Policy: 1994–2004: How can it be explained?. *Afr Aff* 2005;**104**(417):591–614.
- 26 Schwardmann P. A cross-country analysis of the determinants of antiretroviral treatment coverage. CSSR Working Paper no. 217, University of Cape Town, 2008. <http://www.cssr.uct.ac.za>.
- 27 Nattrass N. What determines cross-country access to antiretroviral treatment?. *Dev Policy Rev* 2006;**24**(3):321–337.
- 28 Nattrass N. AIDS inequality and access to antiretroviral treatment: a comparative analysis. In: Shapiro I. (ed). *Divide and Deal: The Politics of Distribution in Developing Countries*. New York: New York University Press, 2008.
- 29 Rozentale B, Sondore V. Health care for HIV/AIDS patients in Latvia' abstract presented at the International AIDS Conference,

- Bankok, 2004. Available on: <http://gateway.nlm.nih.gov/MeetingAbstracts/ma?f=102277871.html>.
- 30 Nguyen V, Grennan T, Peschard K. *et al.* Antiretroviral use in Ouagadougou, Burkina Faso. *AIDS* 2003;**17**(Suppl 3):S109–S111.
- 31 USAID, 2007. Suriname: Caribbean Region HIV and AIDS Service Provision Assessment Survey 2006, USAID, Barbados. Available at: <http://www.ponline.org/docs/322557>.
- 32 USAID, 2007. Republic of Trinidad and Tobago: Caribbean Region HIV and AIDS Service Provision Assessment Survey 2006, USAID, Barbados. Available at <http://www.cpc.unc.edu/measure/publications/pdf/tr-07-49A.pdf>.
- 33 USAID, UNAIDS, WHO, and the Policy Project, 2003. The Level of Effort in the National Response to HIV/AIDS: The AIDS Program Effort Index (API) 2003 Round. Available at: <http://www.policyproject.com/pubs/monographs/API2003.pdf>.