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# THE POLITICAL ECONOMY OF ANTIRETROVIRAL DRUGS

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# The Political Economy of Antiretroviral Drugs[1]


## Abstract

*Anti-retroviral drugs (ARVs) are the only medications capable of extending the lives of those with AIDS. How they are distributed is, therefore, an important concern for both normative and positive reasons. The paper tests various potential theories about the distribution of scarce resources and provision of public goods from political science and economics against new data on the distribution of ARVs under the South African national rollout plan. Strong evidence is found in support of theories that predict that voter interests and knowledge drive the distribution of resources in democracies.*


## Introduction

Anti-retroviral drugs (ARVs), the "AIDS cocktail drugs", are scarce and expensive goods in many African countries. They are the sole medications capable of extending survival for those afflicted with AIDS, slowing the spread of the disease by making afflicted individuals less infectious.[2] Although the drugs are primarily intended for individuals with low white-blood cell counts rather than all current AIDS patients, most of those who have AIDS will eventually need to be placed on the drugs unless a cure is developed. Like any scarce resource, however, important distributional issues arise in the provision of ARVs, particularly in poor and middle-income African countries in which they are scarce and costly goods. Given the life and death stakes that surround the distribution of these pharmaceuticals, it is important that political scientists understand how they are delivered in low- and middle-income settings.


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[2] See the Harvard Consensus Statement on Anti-Retroviral Treatment of AIDS in Poor Countries (2001).

The provincial "rollout" of ARVs in South Africa, which has a national HIV/AIDS prevalence rate of around 15-20%, provides an intriguing case for the study of distributional politics and health goods. The South African rollout was announced by the national government in 2003, shortly before national elections, and officially begun in mid-2004. While the South African ARV rollout is in large part an initiative of the national government, there is in fact considerable variation among South African provinces and districts in the distribution of these drugs. Furthermore, this variation is not well explained by purely technical considerations such as the administrative capacity to administer drugs. On the one hand, the province of Western Cape, with strong health services and large per capita GDP, is among the best equipped to distribute ARVs; accordingly, it established a provincial ARV rollout programme almost 3 years ahead of the other provinces. But if infrastructure is the main determinant of response, then why did Gauteng, a province with comparable resources but a substantially higher rate of infections, not develop a similar programme?

There are strong normative reasons for asking what predicts the distribution of ARVs. Daniels (2004) argues that the distribution of such drugs in poor settings should be set by a process of fair selection rather than political expediency. Disturbingly, AIDS prevalence rates do not satisfactorily explain variation in the ARV rollout. Western Cape has the lowest rate of infection relative to other provinces in South Africa, and yet it has the highest per capita spending on health. Northern Cape, which has the second lowest prevalence rate, is the second highest spender on health per capita. On the other hand, Mpumalanga which has a rate of infection much higher than Northern Cape spends just over half as much on health per capita. To examine the source of these statements see Table 1. These examples serve to illustrate the considerable differences in the allocation of ARVs across South Africa.

How are these scarce and crucial resources distributed? This is an important question for research in political economy both from positive and normative points of view. Understanding how governments dole out goods sheds light on the circumstances under which governments respond to citizen preferences. Normatively, there may be distributional arrangements that are superior to others in terms of efficiency and social justice. Furthermore, in studying the case of ARVs in South Africa we can learn more about the political economy of public health goods and the incentives governments face in delivering goods after an election.

*Table 1: Rollout Figures for the Provinces*

| | *Start of the Rollout* | *HIV prevalence (2005) – ASSA2003* | *Share of the total popu-lation* | *Doctors per 100,000 uninsured persons (2005)* | *Nurses per 100,000 uninsured persons (2005)* | *GDP per capita (2003)* | *Per capita govt health spending (R per uninsured person) 2004/5* | *Total HAART coverage (end of 2005)** |
|---|---|---|---|---|---|---|---|---|
| EC | May 2004 | 9.5% | 14.2% | 17 | 108 | R12,185 | R873 | 21.8% |
| FS | May 2004 | 13.7% | 6.0% | 32 | 143 | R21,437 | R1,193 | 21.0% |
| GT | April 2004 | 14.3% | 20.1% | 42 | 105 | R36,913 | R1,179 | 29.6% |
| KZN | April 2004 | 15.6% | 20.7% | 27 | 107 | R18,528 | R1,017 | 20.0% |
| LP | Aug 2004 | 6.7% | 12.0% | 14 | 111 | R12,040 | R829 | 27.3% |
| MP | Aug 2004 | 13.3% | 7.0% | 19 | 93 | R20,499 | R774 | 20.9% |
| NC | July 2004 | 6.5% | 1.9% | 38 | 141 | R24,922 | R1,238 | 32.3% |
| NW | June 2004 | 12.5% | 8.0% | 13 | 90 | R17,198 | R767 | 24.5% |
| WC | May 2001 | 5.0% | 10.3% | 55 | 106 | R30,628 | R1,433 | 55.7% |
| Total | | 11.0% | 100% | 28 | 109 | R22,569 | R1,014 | 25.2% |

The paper will proceed as follows. In the first section I review the literature on public goods, since we might regard ARVs as a special type of public goods, and develop several broad hypotheses about how scarce goods such as ARVs may be distributed. In this review, I develop the theories and evidence marshaled by other researchers on the topics of how and why governments distribute services and goods to their populaces. In the second section, I discuss the history of HIV/AIDS policy in South Africa. In the third, I present the data and statistical methods used to test my hypotheses. The fourth section uses both the statistical analysis and qualitative record to develop an explanation of variation in the distribution ARVs. I conclude with suggestions for further research on this topic and what the findings imply for South Africa's AIDS crisis.

# ARVs and the Literature on Public Goods

ARVs are only widely available to patients in the developed world and some middle-income countries.[3] There are several reasons for this gap. First, the medications themselves are costly even though prices have decreased in recent years and must be taken continuously for a patient's entire life. A lapse in treatment can lead to a resurgence of symptoms in the patient, potentially resulting in a drug resistant strain, making continuous treatment both individually and collectively desirable.

[3] See Nattrass (2006) for more on these gaps in distribution.

Second, while the infrastructure and services required to administer these drugs is less than the technical apparatus needed for the effective treatment of other chronic diseases such as cancer, it is still considerable. A potential candidate for these drugs must be tested for HIV/AIDS, receive a white blood cell count test, consult with a physician for toxic side-effects and to learn about the dietary and lifestyle restrictions that come with the drugs, be placed on a schedule for ingestion, pick up their prescription and return repeatedly for regular visits to the clinic or hospital to check for negative side effects. While there is little in the way of costly machinery or infrastructure required to provide these services, they require considerable bureaucratic and human services capacity.

Third, ARVs are not necessarily the highest priority for either governments or even citizens in the developing world given the wide range of other problems that affect their populations. Crime, other diseases, education, infrastructural investments and a host of other important concerns may crowd out HIV/AIDS and its treatment as major concerns depending on factors such as the national prevalence rate, which populations tend to be infected and what feasible policy options are available. Even though the risks posed by the pandemic are considerable, we should not simply expect governments to the make controversial, costly and difficult policies to deal with HIV/AIDS their first priority. Citizens may also further inaction because they are not aware of the various policy options, the potential costs of inaction, or because they have demands other than aggressive HIV/AIDS policies.

These three conditions make ARVs both costly and scarce even in a middle-income country such as South Africa, where the need for them is very great. Furthermore, ARVs function in a manner similar to other public goods. While most South Africans do not need to take ARVs, low- and middle-income citizens strongly prefer that the government provide them, both because of the beneficial social effects and because they themselves may one day need to enroll as patients in the rollout. It is useful, therefore, to consider how other work has attempted to study the political determinants of the distribution of public goods.

There is a broad literature on the distribution of public goods in democratic settings, spanning political science and economics, much of it focusing on the reelection incentives of politicians. A common theme is that politicians use public goods to "reward" votes with regionally-specific and costly public works projects.[4] Cox and McCubbins (1986), for example, argue that core supporters

[4] Much has been done on this in the American politics literature. Ferejohn (1974), for example, has examined the distribution of Army Corps of Engineers projects, finding that such projects are more often awarded to districts with greater congressional influence regardless of their objective benefits. In similar work, Cain, Ferejohn and Fiorina (1987) have

are a more reliable and cheaper source of support than swing voters or core opposition supporters. Incumbent politicians use public spending to ensure that these voters return to the polls to maintain them in power. Others have contended that politicians tend to deliver goods to those groups who can tilt election outcomes. Dixit and Londregan (1996) and Lindbeck and Weibull (1987) argue that politicians seek to influence the voting behavior of key groups. Their probabilistic models are extensions of the Median Voter Theorem, which predicts that politicians will seek to cater to the demands of that voter who plays a central role in determining the outcome of an election.

These findings are often couched in terms of single member plurality (SMP) voting systems that cannot always be generalised to proportional representation (PR) voting systems such as South Africa's, in which politicians are elected through lists and may face different incentives for reelection. Lizzeri and Persico (2001) model the provision of public goods under SMP and PR systems, concluding that PR systems are more likely to deliver geographically broader public goods because candidates are accountable to geographically (and perhaps demographically) broader shares of the population. Stratmann and Baur (2001) examine these theoretical intuitions with evidence from Germany, which has a mixed PR and SMP system. They find that those legislators under the SMP system prefer geographically-centered projects for pork, while PR legislators tended towards broader forms of public goods and works.

Further work on vote buying has suggested that politicians can exchange individually directed goods and services (ranging from cash payments to the handout of clothing and food) for the support of constituents. For example, Brusco, Nazareno and Stokes (2004) find that in Argentina, vote buying is an effective strategy in poor districts where politicians can effectively monitor and punish voters who promise support but do not deliver it after receiving goods. The goods delivered by such politicians tend to be smaller and tailored to the individual, making them more effective at securing the votes of individual voters. An interesting implication is that those lower-income voters who received goods from politicians tended to then feel obliged to support those same politicians because they can be monitored and punished.

Not all goods can be delivered individually and voters may be difficult to monitor. In an analysis of spending programmes in both Mexico and the United States, Diaz-Cayeros, Magaloni and Estevez (2003) find that incumbents' tendency to view reelection chances probabilistically affects the distribution of

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examined the bases of the incumbent advantage in both the American and British contexts, finding that citizens expect considerable personal and ombudsman-like services from their representatives in exchange for their support (though the effect is somewhat muted in the party-driven British system)

goods. Core supporters are valued because they can be relied upon to turn out and vote. On the other hand, when incumbents face considerable reelection risks, they may decide to offer goods to "riskier" swing voters in order to secure those crucial extra votes. This mechanism sheds light on why politicians sometimes attempt to woo swing groups and at other times mobilise their base and enhances the previous work of Cox and McCubbins (1986).

Another set of work assesses the importance of non-materialist considerations such as ideological and ethnic ties in the distribution of public goods. Avinash and Londregan (1995, 1996, 1998) examine the question of why swing voters may receive more goods than other groups with a focus on ideology. They contend that voters must trade off distributive and ideological (that is, non-distributive and non-materialist) political demands. Their explanation is that politicians will stake out ideological positions to entice voters who will be swayed by such considerations, but compete on economic policy for more ideologically moderate swing voters. Kasara (2005) offers a complimentary empirical account in the African context, in which some ethnic groups are tied to a particular set of politicians who ostensibly represent their interests. These politicians tend to tax swing groups less than their own constituencies because their core supporters are highly unlikely to vote for other candidates (principally because of strong views on non-distributive political issues). Survey evidence of high levels of black identification with the ANC indicates that a similar effect may be occurring in South Africa, because the ANC receives considerable support because of its role in resisting and dismantling apartheid.[5]

A related literature looks at the impact of ethnic diversity on public goods provision, with much of this work building off of a seminal paper by Easterly and Levine (1997), who find that ethnically diverse countries experience economically worse outcomes. While this work is cross-national, further inquiries have studied single cases. Work by Alesina, Baqir and Easterly (1999) and Alesina and Ferrara (2004) has examined the role of ethnicity in the securing public goods in American communities. Their work is novel in that it proposes that different ethnic groups may have varying "tastes" over which goods they prefer. That is to say, different groups may have different preferences over various goods, making collective action more difficult. In contrast, work by Miguel and Gugerty (2004) has alternately hypothesised that the social sanctioning necessary to secure collective action is less viable in ethnically diverse communities.

In sum, the literature on public goods offers a variety of explanations for variation in public goods provision. Central insights are that politicians use public goods provision strategically, doling out goods in ways that maximise

[5] See Letsoholo (2005).

their chances of reelection, groups may vary in their preferences over goods, and the importance of the (in)capacity of voters to organise to secure public goods.

Most ARVs in the African context are provided by NGOs, development agencies or other non-state actors. Most states in the region often cannot afford or organise to provide ARVs and have become dependent on external actors for assistance in dealing with their epidemics. Unfortunately the range of actors providing these goods and services at varying levels of engagement across different geographic zones makes gathering reliable data very difficult.

These data issues have made Botswana and South Africa useful cases, because of the scope of their epidemics and the availability of data on prevalence, the distribution of drugs and other variables of interest. In both these cases, there is still considerable work being done by NGOs and other agencies, but the governments of both countries have the financial and infrastructural capacities to engage in large-scale preventative and treatment efforts. At this time, both countries have nation-wide, but uneven, ARV distribution plans in which citizens not covered by private-sector plans can apply to receive drugs free of charge from the government. South Africa, with greater variation in prevalence rates, infrastructure and support for the ruling party, makes an excellent case for analysing how a government distributes these costly and service-heavy resources. As I mentioned above, there is considerable variation across and within provinces in how these drugs are distributed. The rates of distribution in districts will be the dependent variable of interest in this paper since it reflects the distributional agenda and capacity of the South African government.

In studying South Africa, four important considerations apply. The first is that the ANC is a hegemonic party that tends to win most seats across the country by moderate to large margins. There are no districts in which the ANC is neither currently nor potentially competitive. I assume that there are only either “safe” or “competitive” regions for the ANC; no “lost” ones, which cannot be won without the proper investment in securing votes.

The second is that since the 2004 elections in South Africa were held under a proportional representation (PR) system in which both provincial and national level lists were voted upon, the relative number of both voters and AIDS patients in each district matters for testing distributional theories. For any analysis to be accurate, it must account for difference of magnitude as well as proportion. Small districts with high AIDS rates may well require fewer drugs than very large districts with smaller AIDS rates.

Third, though the rollout has been ongoing for over two years, district-level data is only available for the first 6 months of the programme. October 2004, the

fourth month, is the last month with full data for all districts. As data is released, I hope to incorporate it into my analysis. This means that whatever conclusions I advance apply only to the initial stages of the programme. This does not affect the conclusions of the paper and provides an opportunity to gauge which districts have been prioritised by the ANC-government in this rollout.

Lastly, the distribution of ARVs is a post-election phenomenon, since the plan was announced prior to the election, but only implemented subsequently. This implies that the ANC is not under immediate electoral pressure to distribute these goods. Rather, the ANC, having promised an effective rollout plan, is now in the position of delivering (or not) on that promise. This raises the issue of a commitment problem between the ANC and its supporters, which will be explored empirically in later sections of this paper.

# Competing Theories of ARV Distribution

What explains variation in which districts distribute more ARVs? One theory, which might be considered something of a non-political explanation, is that there are differences in the health capacities of districts across the country. These infrastructural limitations lead to an inability on the part of the government to deliver the drugs to patients in worse-off districts. Such an explanation assumes that there is genuine determination on the part of the government to distribute the medication, with variation in success coming not as part of a larger strategic interaction between voters and government, but as a constraint on what can be done with the given resources. In some senses, this theory can be considered a “null hypothesis” because infrastructure will have to be controlled for to make any analysis valid. If other explanations do not account for the variation, then it is very likely that it is infrastructure that it leading to differences across regions.

Other explanations can look to strategic political behavior by the ANC. While some of the variation can no doubt be accounted for by infrastructure, political elements also seem important. Spending and allocation decisions are indeed influenced by considerations of need and capacity, but they are also affected by political considerations as the public goods literature has demonstrated.

One potential strategic explanation deals with “demand” side of distribution. Voters, even those with AIDS, have a wide range of additional concerns other than the epidemic, including crime, employment, poverty reduction, education, sanitation and so on. Voters may rank other concerns above AIDS and lead politicians to prioritise the goods that they deliver given that their budget constraints. Consider the following illustration: In a given district there may be

20% of potential voters who list AIDS as a primary concern with crime and education as secondary concerns. If the remaining 80% divide their support for crime and education as their primary concerns, then the government will have a strong interest in funding more crime prevention and educational programmes than AIDS programmes. Thus, even though AIDS may be an important concern, it is not the sole problem faced by South African voters and this may lead to variation among voters on the basis of demand for the drugs.

The above explanation deals with ARVs as a form of pork. That is, ARVs are given to voters who desire them in exchange for electoral support in upcoming elections. The general idea behind such strategic action is as follows: Politicians face the pressures of reelection and thus seek to acquire sufficient votes to be reelected; often seeking comfortable majorities since there are informational issues that come from not knowing how much support one really has. In order to secure these needed votes, politicians cater to the demands of voters, authorising projects that provide voters with the public goods they desire. In essence, politicians purchase political support from voters by giving them the goods and services they demand. In the case of HIV/AIDS, we should expect communities that benefit from such pork-barrel politics to receive more drugs if they have a higher demand for them, controlling for the number of AIDS patients and delivery infrastructure in a given community.[6]

An alternative explanation may rest on the "supply" side in which it is not specifically voter demands that leads to the observed distribution pattern but a strategic decision on the part of the government. Under this hypothesis, those districts in which the ruling party has solid support are rewarded with more ARVs for that support regardless of the demand or numbers of AIDS-infected persons. As the literature review above has shown, there is no predominant or widely accepted theory as to why core supporters may be valued above other types of voters. One plausible explanation, following Diaz-Cayeros et al., is that core supporters are more reliable for turning out to vote than other types of voters after they have received their goods. Brusco et al. have noted that the provision of public goods by politicians is something of a peculiar principal-agent problem in which the politician is relying on voters to engage in costly voting after he or she has provided them with a beneficial policy. Core supporters may be more reliable either because they are easier to monitor or because they are known to have strong intrinsic preferences for the party, as in

[6] It should be noted that politicians can be strategic in their allocation of projects. Some communities may desire funds for new police stations while others may want better roads, leading to the provision of different goods on the basis of different demands. Additionally, the purchasing of votes in some communities may come at too high a price, since voters intrinsically prefer an opposition party, regardless of policy platforms. In the South African case, there are no districts in which such a demographic seems to exist.

the Dixit and Langregan model and the Kasara work, making voting a less costly activity for them. Either way, the key element in this theoretical approach is that politicians see core-supporters as a surer bet for reelection votes than other types, and so go to reward them. An alternative theoretical approach might be one of cost-benefit analysis on the part of politicians. Public goods are costly and difficult to provide, and so politicians seek to provide the minimum number of such goods to win. Since core-voters are assumed to "cost less" since they have some non-material attachment to the party, they are simply cheaper voters to buy votes from.

I cannot, unfortunately, distinguish among these various supply-side explanations with my data. It should be noted, though, that the case I examine is immediately post-election, meaning that the next national election is off in the relatively distant future. At this time, the ANC was freer to pursue goals other than reelection for the time period of the data. Since electoral pressures underpin the "demand" theories described above, why should supply theories matter in this analysis? The ANC's largest core constituency, black South Africans, is much more likely to be afflicted with disease, while also being less likely to have the economic means to independently secure treatments.[7] We might expect ANC politicians to have a normative interest in favoring their constituents, given the magnitude of the disease. More importantly prior to the election the ANC announced the rollout in the face of and emphasised that it would be driven by a concern for those South Africans most afflicted by the disease.[8] In essence, the government promised to deliver an effective programme, and presumably implicitly directed much of that promise to their constituency given that core constituencies matter enormously in PR systems. If such a promise was kept then we should see higher numbers of ARVs going to districts with greater ANC vote share, controlling for level of infrastructural factors.

I summarise the hypotheses generated by supply, demand and infrastructural theories below:

> H1: *"Null" Hypothesis*: Greater infrastructural capacity variables correlate positively and significantly with greater ARV distribution at the district level, controlling for need. No other considerations are significant.
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> H2: *Demand Hypothesis*: Variables that measure demand for ARVs correlate with greater ARV distribution at the district level, controlling for need and infrastructure.

[7] See the Nelson Mandela/HSRC Study of HIV/AIDS (2002)

[8] See Graph 1 for comparisons of public opinion about HIV/AIDS and government performance across South African ethnic groups.

H3: *Supply Hypothesis*: Variables that measure ARV core support correlate with greater ARV distribution at the district level, controlling for need and infrastructure.

It may also be possible that the government is both rewarding its supporters and chasing after new voters with the rollout plan, making both H2 and H3 possible simultaneously. This seems unlikely given the ANC's reluctance to implement treatment in the first place. Furthermore, the costs of such a programme would be very high, potentially threatening the financing of other popular programmes. Since the analysis focuses on the earliest stages of the rollout, it is likely to reflect those areas that the ANC has prioritised. If there is strong evidence for both types of theories, however, they can be effectively distinguished between by examining how much of the variation in distribution demand and vote share each manages to explain vis-à-vis the other.

It is important to note that the strategic theories both assume that the government can somehow limit the amount of citizens placed on ARVs. It could be argued that such an assumption is unwarranted given that if a patient qualifies for the drugs, a clinic will likely enroll them. The situation, though, is more complicated than one of simply demanding and receiving the drugs. In many cases, clinics are chronically understaffed making waiting lists and the times between appointments long. One TAC organiser reported in an interview that it was not uncommon to have official advertisements placed in medical schools and journals for openings at new AIDS clinics, interviews for these jobs conducted, and then no actions taken to actually staff the positions advertised and interviewed for. Drug shipments may also be delayed either through red-tape or slowness in purchasing. The certification procedure for clinics can be made long and arbitrary. Most importantly, both the national ANC government can effectively cut health spending, making it harder to do anything associated with the rollout at the provincial level. In 6 of the 9 provinces, the provincial budget on HIV/AIDS is over 80% funded by the conditional grants from the national government (notably, these provinces are ANC-strongholds).[9] If the government wishes to limit enrollment in the programme, there are a range of means by which it can accomplish this.

# Social, Political and Epidemiological History

South Africa's HIV/AIDS epidemic had its beginnings in the diagnosis of HIV among white gay men in 1982, but little public health work was done on the disease until an AIDS Advisory group was appointed in 1985.[10] The group

[9] IDASA Budget Brief No. 156
[10] Avert.org, an AIDS charity.

remained in a minor advisory capacity and few policies were implemented until national antenatal clinic testing was established in 1990. That year a national antenatal prevalence rate of 0.8%, indicating that to some extent the disease was no longer being exclusively carried by gay men, but by members of the general population.[11] South Africa with its long borders and extensive highways is home to a large trucking network that allowed the disease to travel over large areas through the transient sexual relationships that characterise mobile professions.[12] Subgroups such as truckers, soldiers who contracted the disease abroad, and sex workers all contributed to the explosive growth of the disease over the next twelve years leading to a 2002 national antenatal prevalence of 26.5%.[13] As Barnett and Whiteside (2002) have observed, the southern African disease environment naturally leaned towards transforming HIV/AIDS from a concentrated epidemic (focused mainly on high-risk subpopulations like those mentioned above) to a generalised one in which heterosexual contact became the primary means of infection, leading to the infection of normally low-risk individuals.[14] The South African epidemic could be characterized as one that burgeoned from at-risk populations to that general public, with prevalence reaching enormous levels by the end of the millennium.

During this time, however, there were few efforts made to address the growing epidemic. In 1992, the National AIDS Convention of South Africa (NACOSA) was assembled to develop a comprehensive national strategy for dealing with the AIDS problem (at this point antenatal prevalence was 2.8%).[15] The plan, however, was not presented until 1994 and was condemned by international public health professionals for being poorly conceived and difficult to execute. Unfortunately, public health officials from international organisations such USAID and the WHO were still more focused on and experienced dealing with "traditional" threats such as malaria, tuberculosis and cholera.[16] As a result, little serious pressure was put on the South African government from the international community to address the epidemic. When Al Gore appealed to the South Africa government to address AIDS more seriously during 1996-1998, more time was spent discussing whether parallel licensing of drugs would be an acceptable part of the plan of action, than developing any real plan of action.[17] Since there was little demand on the part of the international community for a

[11] http://www.scienceinafrica.co.za/2003/june/aids.htm, article by Alan Whiteside.
[12] South Africa has 73 500 kms of paved highway and 289 000 kms of unpaved highway. Taken from the CIA World Factbook. For more information read: http://www.kit.nl/frameset.asp?/ils/exchange_content/html/2003-2-south-africa.asp&frnr=1&
[13] Heinecken (2001)
[14] Barnett and Whiteside (2002), pgs 98-124
[15] Avert. Org
[16] Behrman (2004)
[17] Behrman 2004: 142-148

serious and concerted South African strategy to combat HIV/AIDS, many of the approaches taken to satisfy this audience tended to be symbolic and cheap. As a result, debacles such as that of the Sarafina II national play became commonplace. Sarafina II was a theatrical production intended to disseminate awareness yet plagued by medical inaccuracies, overspending and corruption, leading to its eventual cancellation by the European Union, who funded the project. This failed project was emblematic of the government's approach to the problem.[18]

Over this time, though, there was little interest on the part of the general populace for more aggressive HIV/AIDS policies. As late as 2001, HIV/AIDS was mentioned far less than job creation, crime, housing and education as a serious national problem. One study found evidence that individual-level demand for effective policies correlated with personal exposure to deaths.[19] Given that the disease can lie dormant for upwards of 10 years in some cases, this accounts for the lack of public discourse on HIV/AIDS during the 1990s.[20] Even by 2001, only 16% of South Africans had known someone who had died of HIV/AIDS.[21] As more South Africans were infected, ANC politicians faced no serious domestic (or international) demands for stronger HIV/AIDS policies allowing the party to establish hegemony over both national and provincial South African politics. In sum, it is fair to conclude that the 1990s were characterised by a lack of demand on the part of South Africans in the aftermath of apartheid, with the issues of inequality, education, crime and poverty taking precedence. Additionally, there were considerable failures on the part of the international community to bring pressure to bear on the South African government.

In the 5 years that followed this decade of inactivity things would change dramatically. In 2000, Thabo Mbeki, the president following Nelson Mandela, declared at the International AIDS conference that AIDS was caused by poverty and a conspiracy on the part of wealth nations, and that the drugs available to treat the disease were lethally toxic.[22] Mbeki also defended a small group of "AIDS dissidents" who argued that some AIDS treatment drugs actually caused HIV/AIDS. Medical and public health professionals domestically and internationally reacted with outrage, and Mbeki was widely excoriated for his views. The incident garnered worldwide notoriety and sparked serious fears that

[18] Nattrass (2004), pg 45
[19] Whiteside et al. (2002)
[20] Hunter (2003), pgs 17-36
[21] Whiteside et al. (2002)
[22] To read the controversial letter by Mbeki go to http://tmh.floonet.net/articles/mbeki.shtml. Behrman 2004 provides an excellent discussion of the crisis and international reaction (201-206).

the South African government would do nothing to address its crisis. As a result, international pressures on Mbeki grew enormously, with demands for an effective South African HIV/AIDS policy that focused not only on treatment but on the provision of treatment.

At the same time, agitations by domestic groups increased exponentially. The most widely recognised domestic group, the Treatment Action Committee (TAC), began a widely publicised campaign accusing the health ministry of murder for not providing ARVs for infected, impoverished South Africans.[23] The group was heavily staffed by traditional ANC-supporting black Africans and well-funded and organised, making it allegations seem credible.[24] The TAC is widely credited with forcing the creation Mother to Child Prevention Treatment Programme, organised to prevent transmission of the disease from pregnant mothers to their infants. The programme was ordered by the South African supreme court following a fierce legal battle between the TAC and the government, yet was only effectively implemented in 3 provinces (Western Cape, KwaZulu-Natal and Gauteng) in its first year of existence. Nicoli Nattrass has blamed this failure on a lack of political will at the national level, with far-reaching implications for those provinces governed by the ANC, effectively tying them to the decisions made by the Mbeki government.[25] Of the provinces that did implement the programme successfully, two were not ruled by the African National Congress (ANC) at the time and Gauteng, while an ANC-led province, demonstrated lower levels of ANC support in the 1999 elections than most other provinces.

The enormous business costs of HIV/AIDS were becoming better recognised by the private sector, with more and more businesses moving to provide insurance to their employees to prevent turnover from sickness and death.[26] Government bureaucracies, especially the military, also began to note increased attrition among employees their ranks and pressured the government to engage the problem before it reached crisis proportions.[27]

Recent research using the Afrobarometer survey has found that there was a marked rise in the number of respondents who listed HIV/AIDS as an important

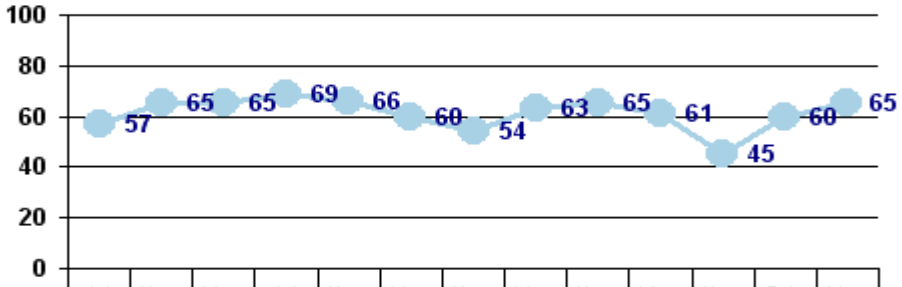
[23] www.tac.org.za has more information.
[24] In 2003, the group was awarded the Nelson Mandela prize, indicating that they are indeed accepted to some extent. From the award's website: "TAC is the first organisation to receive the Award (recipients are usually individuals) in recognition of TAC's effectiveness in mobilising a broad public coalition in support of its goals." http://www.kff.org/southafrica/20000829a-index.cfm
[25] Nattrass (2002), pgs 66-67
[26] Nattrass (2002)
[27] http://www.up.ac.za/academic/cips/Publications/41-2004%20HIV-Aids%20and%20the%20Military%20Environment.pdf,

funding priority for the government from 2002 to 2004 from 40% to 56%.[28] Additional public opinion work by the Markinor firm has complemented these results with evidence that support for the ANC's HIV/AIDS policy has decreased substantially in 2003, prior to the election (see Graph 1). While it is beyond the scope of the paper to account for this change in opinion, it is likely that the combination of NGO campaigning, international pressures and individual experiences with family and friend deaths from AIDS contributed to this change in public opinion.

Resistance to the implementation of more aggressive AIDS-treatment policies has been a hallmark of the Mbeki administration. Both the president and his secretary of health, Manto Tshabalala-Msimang, have repeatedly emphasised the dangers of ARVs, the importance of other traditional approaches to treating AIDS and the potentially ruinous costs of providing such medications. Why Mbeki and others in the ANC resisted ARVs and tougher action in the face of HIV/AIDS is a difficult question to answer. I will avoid speculation on this issue since it may simply be that he and others within the ANC are ideologically opposed to aggressive HIV/AIDS policies.

*Graph 1: Public Opinion and HIV/AIDS*

**ADDRESSING THE PROBLEM OF HIV/AIDS: GOVERNMENT IS HANDLING THE ISSUE "VERY WELL"OR "FAIRLY WELL"**




| | Jul '99 % | Nov '99 % | May '00 % | Jul '00 % | Nov '00 % | May '01 % | Nov '01 % | May '02 % | Nov '02 % | May '03 | Nov '03 | Feb '04 | May '04 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blacks | 63 | 70 | 69 | 76 | 72 | 67 | 58 | 69 | 69 | 67 | 49 | 65 | 71 |
| Coloureds | 46 | 56 | 55 | 62 | 58 | 49 | 52 | 51 | 50 | 46 | 43 | 51 | 58 |
| Indians | 51 | 68 | 61 | 69 | 61 | 57 | 57 | 57 | 74 | 59 | 50 | 50 | 67 |
| Whites | 35 | 45 | 51 | 40 | 40 | 31 | 35 | 43 | 47 | 37 | 28 | 37 | 38 |
| Total | 57 | 65 | 65 | 69 | 66 | 60 | 54 | 63 | 65 | 61 | 45 | 60 | 65 |

Source: Markinor Firm.

Faced with stiff criticism from political opponents and legal threats from the TAC and its allies, it is widely speculated that Mbeki's cabinet in late 2003 took the rare step of overruling the president on the issue of wide-scale, free

[28] Afrobarometer Briefing Paper 14

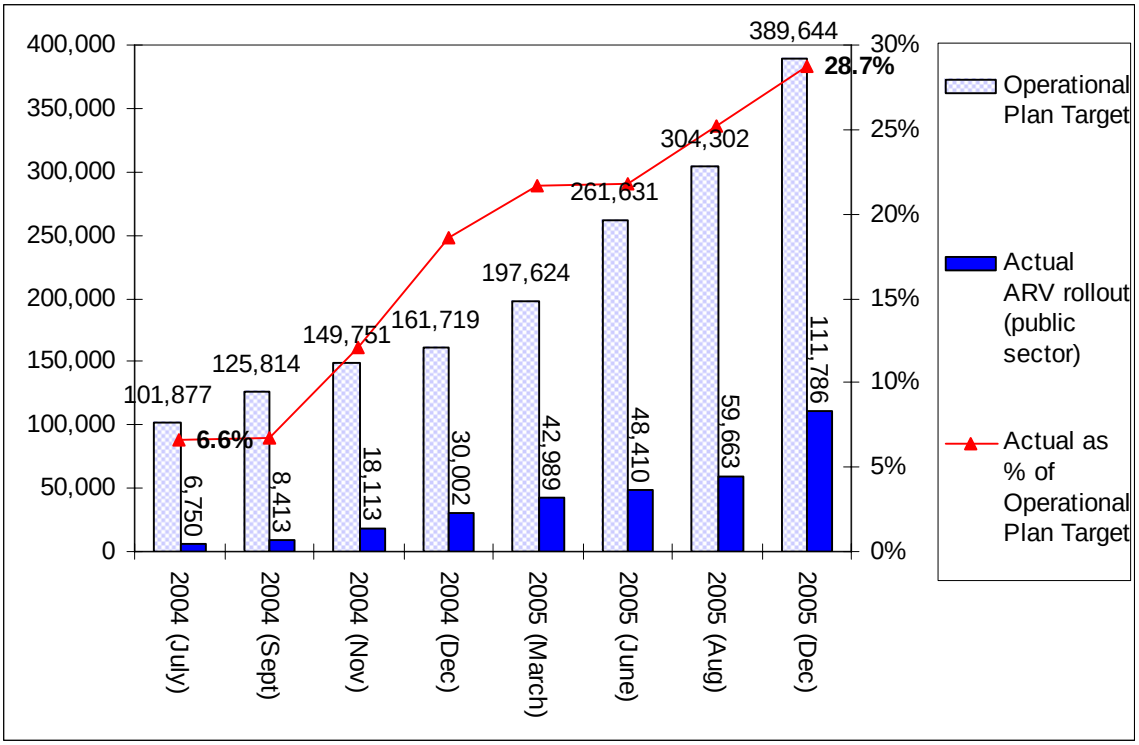
provision of ARVs.[29] This is impossible to verify, given that the minutes of such proceedings are kept secret, but shortly after this meeting it was announced that a rollout of the drugs would be commenced in 2004, with the earlier Western Cape provision being incorporated into this larger plan. As the Markinor data shows, the announcement of the plan quieted fears among blacks and Indians, the ANC's key constituencies for the election. This allowed the party to win an even larger majority national vote-share than it held previously and placing it in control of 8 of the 9 provincial governments. Whites and coloureds, to a lesser extent, remained strongly critical of the ANC's policies. These gains came even as most South Africans saw HIV/AIDS as a responsibility for the national government, with 61% reporting that the national government should be responsible for HIV/AIDS policy, versus 25% and 14% respectively saying that the provincial or municipal governments should be responsible.[30]

In the months following the election, the rollout was repeatedly delayed through personnel shortages and bureaucratic red-tape contributing. The TAC in its first evaluation found that the rollout was not proceeding effectively in most areas, with clinics in the provinces of Mpumalanga and Limpopo, both ANC strongholds, faring far worse than the rest of the country.[31] An analysis of the ARV rollout by Nicoli Nattrass has found that the rollout continues to fall far short even of the government's announced goals (see Graph 2).[32] The plan, through additional generous funding by PEPFAR and other AIDS-related programmes, has rapidly outpaced other sources of ARVs. The total public sector provision is roughly 57.7% of all ARV receivers. Private care through insurance, work-related and self-funded modes of treatment amounts to roughly 36.7% of the total number of treated patients. Not-for-profit provision remains at only 5.5% of all the treated, meaning that most economically disadvantaged South Africans with AIDS will almost certainly have to rely on publicly distributed ARVs.

While the history of HIV/AIDS policy in South Africa seems to confirm the importance of politics and political considerations in the actions taken by successive ANC governments, it does not allow us to distinguish among the theories I detailed earlier. Using statistical methods to disentangle these various effects will be the focus of the next section.

[29] The South African cabinet is one of the few in the world that can, in private meetings, overrule the president.
[30] Markinor poll
[31] "Let Them Eat Cake – A Short Assessment of Provision Treatment and Care 18 Months After the Adoption of the Operational Plan"
[32] Nattrass (2006)

*Graph 2: Actual and Projected ARV Rollout Figures*




Source: Nattrass (2006)

# Methods and Data

To test the above theories, I have collected a dataset covering the first 6 months of the ARV rollout of South Africa. In analysing this data, I employ several regression approaches to deal with two outlier districts: the Cape Town and Johannesburg metropolitan areas are theoretically important, but outliers far out in the tails of the distributions for population, income, health infrastructure, and the distribution of drugs. Furthermore, they have lower levels of support for the ANC. If these two districts were simply put into a regression, they would come to drive the results of the regression. I use two techniques to deal with their impact. I estimate regressions using robust least squares estimation (RLS) to produce coefficient estimates that are less heavily driven by the outliers.[33] I also take the initial distribution of AIDS-drugs in the first month of the programme as a control for the initial advantages of Cape Town and Johannesburg. The latter technique also manages to better account for variation in infrastructure among the provinces since any gains between commencement and the later month are due solely to government investiture.

[33] Robust regression is a widely researched topic in statistics. For important works see Huber (2003) and Hampel et al. (2005). I base my practice on the recommendations of Venables and Ripley (2002), 156-163.

## Dependent Variable[34]

OCT: The dependent variable I use is district-level observations of patients enrolled (and therefore drugs distributed) in the fourth month (October, 2004) of rollout plan by district. The data come from reporting by each of the provincial health ministries in response to a TAC-led lawsuit against the government to reveal the number of patients on treatment. I use the fourth month for several reasons. First, it takes at least several months for any distributional plan to begin to function adequately. The graph of the actual rate of the rollout versus the expected rate from ASSA demonstrates this convincingly (see graph 2). Second, since the Western Cape had an earlier start than the other provinces, by using a later month, I am able to allow for more convergence in distribution by the other provinces.

## Control Variables

HIVAIDS: Controlling for the need for the drugs in a given province is important and entails knowing the number of individuals who need these drugs. This exact number of individuals who have a white blood-cell count low enough to require the drugs is unavailable since the monitoring of HIV/AIDS is a difficult task. I proxy for this by using reported 2004 antenatal clinic HIV/AIDS prevalence at the district level as reported by the Health Systems Trust Health Barometer 2004.

IMMUN: Measuring the capacity of a given district to deliver the drugs depends heavily on the ability of a given province to be able to provide service-intensive medical care. One such measure of this is the child immunisation rate, since the medical requirements for immunising a child are not unlike those required for HIV/AIDS (both require monitoring, check-ups and laboratory work). I gathered this variable from the Health Systems Trust Health Barometer 2004.

POP: Many of the variables of interest in this study are dependent on the magnitude of a particular population within a province. I include population, as coded from the 2001 Census to control for differences in population size between provinces.

[34] Two districts were merged in the report from which I coded the dependent variable. I was also required to drop an additional three because they did not contain some measures on one of the three control variables. These absences do not seem to be systematic and so I do not regard them as a problem for my analysis.

JUL: This is the initial level of distribution in the rollout, coded similarly to OCT. I use it as a control for the initial advantages of Cape Town and Johannesburg

## Independent Variables

ANCVOTE: If there is evidence of a supply-side dynamic, then we should expect that great ANC-support, *ceteris paribus*, leads to greater number of ARVs being distributed. This returns to the issue of the ANC's original pre-election promise to distribute these drugs effectively to those who need them most. It is important to consider not only vote-share, but the numbers of voters in a PR system, so I control for population. I used the ANC vote-share for each district in the 2004 South African national elections for this variable, coded from the South African Elections monitor.

DEMAND: In order to measure the demand among voters in a district for ARVs, I recoded survey data from the 2002 South African Afrobarometer survey from the municipal to the district level using maps. If a demand driven dynamic is at work in the distribution of ARVs, then higher demand should correlate with more ARV distribution. I then constructed a proportion, for each district, of respondents who listed HIV/AIDS as one of their top three concerns for the nation.

INCOME: It may be that those with higher income desire the drugs more because wealthier citizens are likely to have fewer day-to-day concerns than poorer citizens. They do not have to divide their pressures on their politicians among multiple issues. They may also treat the problem of ARV distribution as something like a post-materialist policy, a matter of good governance, and have the financial capacities to monitor its distribution. A positive coefficient on INCOME can be taken as evidence in favor of demand as a factor in the distribution of these drugs. I measure income by the proportion of individuals in a district who earned above the mean income for South Africa, using 2001 Census data.

RURAL: This is a measure that seeks to account for the differences between rural and urban districts, since rural districts are less likely to be able to organise to pressure the government for more drugs (controlling for differences in medical services and infrastructure). A significant and rural coefficient for RURAL, can be interpreted as an indication of a demand driven dynamic (since I am already controlling for infrastructure). The variable is coded from the Afrobarometer survey, in which respondents were identified as being from an urban (coded as 1) and rural (coded as 2). I averaged these identifications over

each district to give a rough measure of how rural a district is. The measure ranges from 1 (very urban) to 2 (very rural).

COLORED/INDIAN/WHITE: Coloreds are an important ethnic swing group in western South Africa, since they are not traditional ANC supporters, and hence the presence of colored voters may indicate voters whose support can be bought with better drug programmes by the ANC. Particularly since they are more critical of the government's HIV/AIDS policy. Indians follow a different logic as a group. They are heavily concentrated in the KwaZulu-Natal region and are an important and loyal constituency for the ANC there. They also tend to be less critical of the ANC's HIV/AIDS policies. Whites, on the other hand, traditionally vote against the ANC. They also tend to be wealthier and more critical of the government's HIV/AIDS policies. Taking these observations together, we may conclude that positive and significant coefficients on COLORED and WHITE are an indication of demand-centered policies. A positive coefficient on the INDIAN variable is evidence, on the other hand for supply driven policies. The three variables are coded from the 2001 National Census and measure the size of each group relative to total population in each district.

ELF: This variable is an ethnic fractionalisation index constructed from the 2001 Census data. I include it to test for similar mechanisms to those found by Alesina et al. and Easterly and Levine.

## Hypotheses

Table 2 reports the different independent variables and links them to two of the broader theories I outlined in the previous section. If a variable is significant at the 5% level or less, then the sign of its coefficient can be constituted as evidence for one of the theories. The magnitude of the coefficient relative to others in the regression will also be important indication of how much support the theory has from the evidence. If no independent variables are significant, then it is likely that it is infrastructure that has the strongest effect on how receives these drugs.

*Table 2: Variable Predictions*

| Variable | Theory | Expected Sign if Theory Accurate |
|---|---|---|
| ANCVOTE | Supply Side | negative |
| DEMAND | Demand Side | positive |
| INCOME | Demand Side | positive |
| RURAL | Demand Side | negative |
| COLORED | Demand Side | positive |
| WHITE | Demand Side | positive |
| INDIAN | Supply Side/Demand Side | positive/negative |

# Results

Table 3 presents the results of my analysis. Model 0 is the baseline regression, which uses only the control variables. Surprisingly, only POP has a significant coefficient at conventional levels, indicating that more populous districts are more likely to be receiving drugs. Both IMMUN and HIVAIDS have positive coefficients, nonetheless, which fit with expectations prior to the tests.[35] Model 1 adds the variable ANCVOTE to the basic model. The sign on the coefficient is large and negative, which fits with the interpretation that the ANC seeks to distribute ARVs in regions where its vote share is not assured. ANCVOTE's coefficient has a large t-value, but is not significant at conventional levels leaving us unable to reject the hypothesis that ANC vote-share has no impact of ARV distribution. Model 2 adds DEMAND to the basic model, though the coefficient is clearly not significant. Model 3 puts INCOME in the basic model, which returns a relatively strong and very significant effect. The presence of a higher proportion of wealthier individuals in a given district leads to a greater distribution of ARVs in that district. This fits well with the demand-side process I described above. The fourth model tests the effect of the RURAL. The result is a negative coefficient which is statistically significant. Like INCOME, RURAL is a useful measure of demand for the drug since protests and monitoring of the rollout is likely to be much harder in rural districts.

Models 5, 6 and 7 test the ethnic variables. WHITE and COLORED are both positive, with nearly identical coefficients, and both are significant, though white has a slightly higher t-value. INDIAN is also significant, though its coefficient is negative. These three models constitute strong evidence of demand-drive dynamic, in which ethnic groups who have been critical of the

[35] I had to use a slightly different estimation method for Model 0 than the others since the algorithm for the maximum likelihood estimate did not converge. I adjusted the breakdown point of the model's estimate to achieve convergence after running comparable models with OLS estimate. All other models converged, and were estimated with RLS using a suitably modified version maximum likelihood.

government's HIV/AIDS policies receive more drugs. Indians, a traditional ANC constituency, are less critical and thus receive fewer drugs.

*Table 3: RLS Estimates*

| Variable | Model 0 | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 |
|---|---|---|---|---|---|---|---|---|---|
| **ANCVOTE** | | **-2.3238** | | | | | | | |
| | | **(-1.5959)** | | | | | | | |
| **DEMAND** | | | **0.035** | | | | | | |
| | | | **(-0.7716)** | | | | | | |
| **INCOME** | | | | **0.2784** | | | | | |
| | | | | **(-6.2989)** | | | | | |
| **RURAL** | | | | | **-0.1174** | | | | |
| | | | | | **(-3.1578)** | | | | |
| **COLORED** | | | | | | **0.1113** | | | |
| | | | | | | **(-2.3018)** | | | |
| **WHITE** | | | | | | | **0.113** | | |
| | | | | | | | **(-3.0042)** | | |
| **INDIAN** | | | | | | | | **-0.1171** | |
| | | | | | | | | **(-2.2696)** | |
| **ELF** | | | | | | | | | **0.1136** |
| | | | | | | | | | **(-2.8621)** |
| POP | 0.2169 | 0.4045 | 0.4295 | 0.1659 | 0.3936 | 0.4395 | 0.3672 | 0.4131 | 0.4254 |
| | (-6.4315) | (-10.6126) | (-9.656) | (-3.8786) | (-11.3088) | (-11.9912) | (-10.2252) | (-8.9208) | (-11.1774) |
| IMMUN | 0.0226 | 0.052 | 0.0616 | -0.0078 | 0.3936 | 0.0457 | 0.0359 | -0.0665 | 0.0475 |
| | (-0.6605) | (-1.3188) | (-1.3814) | (-0.2605) | (-0.7827) | (-1.177) | (-1.0013) | (-1.612) | (-1.2345) |
| HIVAIDS | 0.0399 | 0.0197 | 0.0238 | 0.0149 | 0.006 | 0.1028 | 0.0561 | 0.0665 | 0.0632 |
| | (-1.1546) | (-0.5018) | (-0.527) | (-0.5287) | (-0.1704) | (-2.2304) | (-1.5832) | (-1.1042) | -1.6484 |
| CONSTANT | -0.1952 | -0.122 | 0.035 | -0.1406 | -0.1092 | -0.1131 | -0.1268 | 0.0513 | -0.1057 |
| | ( -5.9180) | (-3.2720) | (-0.7716) | (-5.2546) | (-3.3239) | (-3.1662) | (-3.8250) | (-1.1042) | (-2.9458) |
| N | 48 | 48 | 47 | 48 | 48 | 48 | 48 | 48 | 48 |
| Adjusted R-Squared | 0.2165 | 0.4152 | 0.4013 | 0.4352 | 0.4366 | 0.4386 | 0.4125 | 0.3998 | 0.4101 |

Notes:
All variables (and coefficients) standardised.
(T-values in parentheses)
Dependent Variable: OCT

These initial tests reveal strong evidence in favor of demand-type theories, but it now become important to test them against one another. Is it ethnic politics that drives ARV distribution, the presence of wealthier South Africans, or the inability of communities to organise, monitor and protest poor government performance? While it is likely to be some combination of all three, by comparing each explanation against the others, it is possible to gain some leverage on which best determines ARV distribution.

Table 4 presents some regressions I ran to test the various theories against one another. Model 8 continues to use robust least-squares estimation, with INCOME, RURAL, COLORED, WHITE and INDIAN added to the control variables. In this regression, only INCOME and INDIAN remain significant.

The INCOME coefficient remains positive and has the largest magnitude. The INDIAN coefficient stays negative, though its effect is relatively small. Recall that the motivation for using RLS was the concern that the outliers of Cape Town and Johannesburg would have too much influence over the regression results. In Models 9 and 10, I will make sure that the results are not driven by either city, despite the use of robust regression. Model 9 uses ordinary least-squares estimation, but uses a dummy variable (CPTJOB DUMMY) to isolate the effects of Cape Town and Johannesburg on the other variables.[36] Unsurprisingly, the enormous effects of Cape Town and Johannesburg are largely driving the regression, leaving only the control variable POP significant at conventional levels. INCOME, though, comes very close to being significant at the 5% level, with a t-value of roughly 1.73 (versus 1.96 for 5% significance). Model 10 also employs OLS, though it estimates the regression on reduced sample in which Cape Town and Johannesburg are dropped. Only INCOME, among the explanatory variables, remains significant, and its effect grows *without* Cape Town or Johannesburg.

I ran a final battery of tests to confirm my results. These regressions, shown in table 5, use the initial distribution of drugs (JUL) as a control for the later distribution (OCT). Model 12 is the baseline model. JUL, POP and HIVAIDS are all significant with positive coefficients. These coefficients remain this way in all the other models (except for model 15, where POP fails to be significant). Models 13 – 20 introduce the various independent predictors, with only RURAL and INCOME producing significant results. INCOME has a strongly positive effect, while the effect of RURAL is weakly positive. Model 21 compares all the variables together, with only JUL and INCOME remaining significant. This lends added confidence to the assertion that it the greater presence of middle- and high-income citizens that drives the distribution of ARVs in South Africa.

[36] The adjusted R-squared is increased considerably since the normal OLS estimation minimizes the sum-of-squares. In the robust regressions, the adjusted R-squared is much smaller since the regression specifically *does not* account for the maximum amount of variance among the dependent variable since doing so would overvalue the effects of outliers.

*Table 4: RLS and OLS Estimates*

| Variable | Model 9 (RLS and full data) | Model 10 (OLS and full data) | Model 11 (OLS and reduced data) |
|---|---|---|---|
| INCOME | 0.2701 | 0.1355 | 0.3521 |
| | (-3.5838) | (-1.788) | (-1.711) |
| RURAL | -0.0522 | -0.0648 | 0.06381 |
| | ( -1.1647) | (-1.462) | (-0.522) |
| COLORED | 0.1072 | 0.1064 | 0.1234 |
| | (-1.3731) | (-1.378) | (-0.579) |
| WHITE | -0.0205 | 0.0506 | -0.3665 |
| | (-0.2872) | (-0.672) | (-1.88) |
| INDIAN | -0.0673 | -0.038 | -0.337 |
| | (-1.3172) | (-0.706) | (-2.416) |
| ELF | -0.0866 | -0.1178 | 0.2905 |
| | (-0.8705) | (-1.157) | (-1.069) |
| CPTJOB DUMMY | | 3.6622 | |
| | | (-15.89) | |
| POP | 0.2155 | 0.2102 | 0.6799 |
| | (-3.3344) | (-2.985) | (-3.853) |
| IMMUN | -0.0222 | -0.0185 | 0.1064 |
| | (-0.6256) | (-0.514) | (-1.1) |
| HIVAIDS | 0.0561 | 0.06443 | 0.7534 |
| | (-1.116) | (-1.296) | (-0.549) |
| CONSTANT | -0.1394 | -0.1526 | 0 |
| | (-4.6769) | (-4.920) | (0) |
| N | 48 | 48 | 46 |
| Adjusted R-Squared | 0.3798 | 0.9583 | 0.682 |

Notes
All variables (and coefficients) standardised.
(T-values in parentheses)
Dependent Variables: OCT and OCT without Cape Town and Johannesburg

*Table 5: OLS Estimates*

| Variable | Model 12 | Model 13 | Model 14 | Model 15 | Model 16 | Model 17 | Model 18 | Model 19 | Model 20 | Model 21 |
|---|---|---|---|---|---|---|---|---|---|---|
| **ANCVOTE** | | **-0.01201** | | | | | | | | **0.000453** |
| | | **(-0.434)** | | | | | | | | **0.014** |
| **DEMAND** | | | **0.007588** | | | | | | | **-0.01713** |
| | | | **(0.258)** | | | | | | | **(-0.428)** |
| **INCOME** | | | | **0.1408** | | | | | | **0.204** |
| | | | | **(3.536)** | | | | | | **(3.314)** |
| **RURAL** | | | | | **0.05532** | | | | | **-0.0405** |
| | | | | | **(-1.911)** | | | | | **(-0.892)** |
| **COLORED** | | | | | | **0.01747** | | | | **0.06812** |
| | | | | | | **(0.481)** | | | | **(0.957)** |
| **WHITE** | | | | | | | **0.03198** | | | **-0.03660** |
| | | | | | | | **(1.073)** | | | **(-0.544)** |
| **INDIAN** | | | | | | | | **-0.003551** | | **0.04958** |
| | | | | | | | | **(-0.099)** | | **(1.009)** |
| **ELF** | | | | | | | | | **0.01714** | **-0.1069** |
| | | | | | | | | | **(0.579)** | **(-1.187)** |
| JUL | 0.9047 | 0.9013 | 0.9055 | 0.8675 | 0.8930 | 0.9007 | 0.8985 | 0.9034 | 0.9002 | 0.8834 |
| | (22.321) | (21.613) | (21.666) | (23.124) | (22.427) | (21.572) | (21.983) | (20.956) | (21.644) | (19.144) |
| POP | 0.1234 | 0.126 | 0.1258 | 0.0499 | 0.182 | 1.273 | 0.1177 | 0.1259 | 0.1223 | -0.006544 |
| | (3.152) | (3.152) | (3.019) | (1.091) | (3.104) | (3.157) | (2.985) | (2.693) | (3.095) | (-0.101) |
| IMMUN | -1.012 | -0.0163 | -0.01388 | -0.03652 | -0.02663 | -0.1335 | -0.1712 | 0.009777 | -0.01324 | -0.04925 |
| | (-0.350) | (-0.395) | (-0.450) | (-1.364) | (-0.906) | (-0.445) | (-0.578) | (-0.331) | (-0.446) | (-1.624) |
| HIVAIDS | 0.08581 | 0.08377 | 0.08728 | 0.07007 | 0.07327 | 0.09478 | 0.0905 | 0.08699 | 0.08812 | (0.05806) |
| | (3.033) | (2.893) | (2.866) | (2.745) | (2.595) | (2.779) | (3.166) | (2.807) | (3.060) | (1.338) |
| CONSTANT | 0 | 0 | -0.001465 | 0 | 0 | 0 | 0 | 0 | 0 | -0.001149 |
| | (0) | (0) | (-0.054) | (0) | (0) | (0) | (0) | (0) | (0) | (-0.047) |
| N | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 |
| Adjusted R-Squared | 0.9674 | 0.9668 | 0.9667 | 0.9743 | 0.9693 | 0.9668 | 0.9675 | 0.9667 | 0.9669 | 0.9728 |

Notes
All variables (and coefficients) standardised.
(T-values in parentheses)
Dependent Variable: OCT

# An Informational Explanation

With the statistical results pointing in the direction of a demand-driven pattern to ARV distribution, it is now time to turn to incorporating theory and the qualitative record into an explanation of why there is such a pattern of ARV distribution in South Africa. The rollout plan was announced by the ANC prior to the 2004 elections in response to growing disenchantment with their HIV/AIDS policies, and was likely "forced" on Mbeki and Tshabalala-Msimang by other cabinet ministers. Since the commencement of the plan, it is very unlikely that either Mbeki or his supporters within the ANC have shifted their stance on ARVs. Though they do not speak out directly against the plan, ARVs are infrequently mentioned in government announcements about HIV/AIDS, except in relation to the rollout and how well it is proceeding.

Alesina, Baqir and Easterly argue that different groups have different preferences over public goods. While this point may be unlikely with many types of goods (for example, every groups desires better schools, roads, police and so on), it may well be that particular groups in some districts are better able to monitor whether the government is intentionally failing to live up to its responsibilities. This turns the idea of politicians monitoring citizens proposed by Brusco et al. on its head, with citizens monitoring the government's performance. The idea is not a new one, especially in the African context. Robert Bates (1984) argued that many African states had their agricultural policies driven by urban constituencies more capable of organising to pressure the government. In the case of ARVs, those individuals with the time and resources necessary to monitor the government's performance are likely to be middle-class or wealthier. They are able to fund and participate in NGOs such as TAC, attend protests and support legal action against the government. Poor South Africans are less likely to have the resources to support action against the government and will be less informed as to why the programme is such a failure in their districts.

Wealthier South Africans will also be able to convey information gathered about the government's (in)action to other districts through protests, legal pressures and the media coverage that accompanies both. Why should the government care about protests and the negative information they convey? There are two important reasons. The first is that South Africa has paid considerable reputation costs internationally as a result of its inaction. Stephen Lewis (2006), the UN special envoy on HIV/AIDS has been publicly critical of the ANC's government on its inaction. Since large portions of the government's HIV/AIDS and development programmes are funded by other governments and international organisations, appearing "soft" on AIDS could carry serious

consequences, with such funding being cut or even rescinded. On the domestic front, HIV/AIDS is growing as an important electoral issue. More and more citizens are coming to regard HIV/AIDS policies as comparably important with those of the economy, crime and education. A failure to take HIV/AIDS seriously could lead serious electoral vulnerability on the part of the ANC in later elections, as NGOs can keep issues that might otherwise be forgotten at the front of voters' minds.

We can thus read the ANC-government's behavior as being one of delivering drugs to those districts in which citizens who are best able to gather information about the government's success and communicate this information to citizens in other districts. Those districts populated by citizens who are less able to monitor and protest against the government are short-changed because much of the government has a strong ideological interest in not promoting these drugs. In some sense, the ANC is attempting finding a compromise between its ideological leanings and the pressures of satisfying electoral constituencies. It is delivering an ARV programme "on the cheap": distributing the drugs widely only in those constituencies in which not doing so would lead to political costs. It is important to note that these *may not* be districts with higher need or demand for these drugs, as the statistical insignificance of my income and need variables indicates.[37] Those districts that receive more drugs only need to possess a large enough proportion of sufficiently wealthy citizens to support the activities of NGOs who can monitor and punish the government for ineffective actions.

# Conclusion

In this paper, I have presented an analysis of the initial stages of the South African ARV rollout. I find evidence that the distribution of drugs is strongly influenced by political considerations; namely, that the government seeks to minimize the numbers of drugs it distributes without incurring political costs. The ANC achieves this by distributing drugs effectively in those areas in which citizens are able to monitor the programme and disseminate information about distribution widely, and under-distributing in those regions in which citizens cannot monitor the government or disseminate information effectively.

Over the long-term, such a policy seems unsustainable because policy attitudes towards HIV/AIDS tend to be set by personal experiences of illness and death. As ARVs consistently fail to be distributed and more deaths occur, citizens will

[37] In fact, both INCOME and DEMAND only weakly correlate with HIVAIDS, each having an absolute correlation of under 0.25.

start to ask the government some hard questions. Preliminary data show that there is some convergence between regions, though the lack of solid empirical data on the programme makes it very difficult to analyse what the precise trends are.

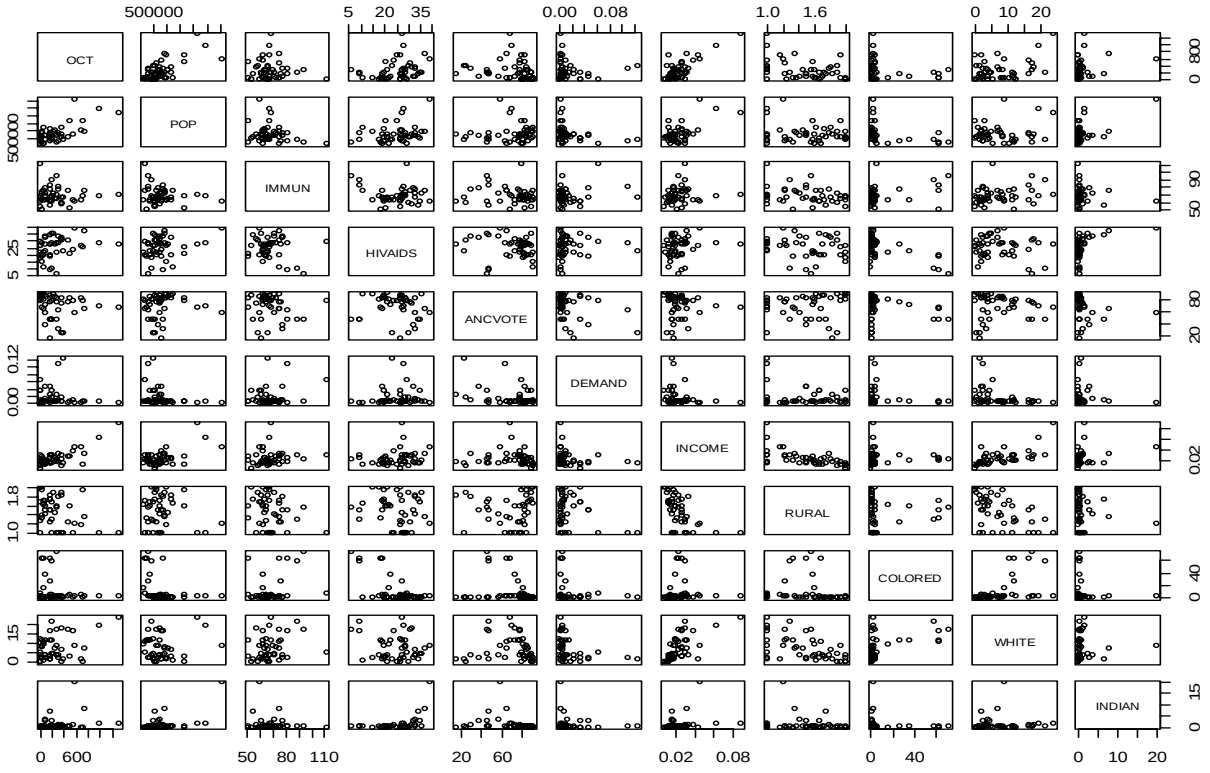
The results of this study, though, suggest two clear policy recommendations. The first is that international organisations and other governments make their funding to South Africa (and other African governments) conditional on maintaining widely available and externally monitored data about their programmes, especially who and where the recipients are of ARVs and other goods and services. Such publicly available data will make it far more difficult for a government to falsely suggest that it has an effective and broad ARV programme when it does not by making monitoring of such activitiess and the dissemination of information a less costly activity for individuals in all districts. The second is that NGOs, both African and international, should make efforts to organise individuals in both lower-income and rural districts. They should also make substantial efforts to secure media coverage on protests in such areas, as such negative attention is likely to induce the political costs necessary to force governments to take action.

# Appendix

*Appendix table: Correlations among Variables:*

| | OCT | POP | IMMUN | HIVAIDS | ANCVOTE | DEMAND | INCOME | RURAL | COLORED | WHITE | INDIAN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT | 1 | | | | | | | | | | |
| POP | 0.68388 | 1 | | | | | | | | | |
| IMMUN | -0.06755 | -0.21887 | 1 | | | | | | | | |
| HIVAIDS | 0.29077 | 0.26020 | -0.17966 | 1 | | | | | | | |
| ANCVOTE | -0.11880 | 0.08397 | -0.13380 | -0.11690 | 1 | | | | | | |
| DEMAND | -0.1054 | -0.2866 | 0.22212 | 0.06187 | 0.34078 | 1 | | | | | |
| INCOME | 0.78277 | 0.59905 | 0.13026 | 0.18587 | -0.02837 | -0.21631 | 1 | | | | |
| RURAL | -0.42072 | -0.12845 | -0.26018 | -0.18189 | 0.05767 | -0.26619 | -0.57991 | 1 | | | |
| COLORED | -0.18005 | -0.31874 | 0.32178 | -0.59440 | -0.21511 | -0.16000 | 0.01791 | -0.05721 | 1 | | |
| WHITE | 0.36974 | 0.13218 | 0.24246 | -0.16835 | -0.02058 | -0.36172 | 0.6422 | -0.54383 | 0.49272 | 1 | |
| INDIAN | 0.27070 | 0.5433 | -0.11076 | 0.46974 | -0.20632 | -0.09008 | 0.24690 | -0.14700 | -0.13117 | 0.01237 | 1 |

*Appendix graph: Scatterplot Matrix of Variables*



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