Organizational Networks, Divided Policy Authority, And The Effects On Botswana's Hiv Response Regime

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The UNAIDS framework for HIV response called for 3 "Ones": one strategy, one coordinating authority, and one monitoring framework. Under the direction of President Festus Mogae, Botswana established the National AIDS Coordinating Agency (NACA) to bring together and direct the various government efforts against the epidemic. The African Comprehensive HIV/AIDS Partnership—a PPP bringing together the Botswanan government, Merck Pharmaceuticals, and the Gates Foundation—brought relatively large financial resources to Botswana and became an alternative source of gravity in the Botswanan response. This paper examines how a PPP intended to assist in a national HIV program became a problem: with the advent of ACHAP, practical responsibility for the shape and direction of the national program seemed to have two loci of power. For those trying to help implement Botswana HIV policy, there appeared a division in the locus of power: NACA had the final authority, while ACHAP had the superior resources. I examine the network structure of government and PPP actors, and I analyze how the unintentional division brought about by establishing a PPP lessened anti-HIV action at a critical period in the nation's response to the disease.

1 Introduction

HIV has proven to be the most significant public health event of the latter twentieth and early twenty-first centuries. To date, HIV has infected about 78 million people: 35 million currently live with HIV or AIDS, and 39 million have died since the start of the epidemic in the 1970s. The rise of HIV has coincided with the innovation of new forms of social governance, whether global, transnational, or local in scope. In particular, national governments, multinational pharmaceutical and medical corporations, and international organizations have sought to leverage the joint strengths of public and private sectors via a Public-Private Partnership (PPP).

The PPP appeals to all sorts of actors, because it is supposed to combine the agility, and efficiency of the private, for-profit sector with the transparency and universalism requirements of the public sector (Lynn 1984, 149ff.).

A key component of the Botswanan HIV response was a PPP founded in 2000 and initially composed of the Merck Foundation (Merck Pharmaceuticals' philanthropic foundation), the Bill and Melinda Gates Foundation, and the Botswanan national government. This PPP was named the African Comprehensive HIV/AIDS Partnership (ACHAP). Merck was the initiating member of the PPP, and the partners selected a PPP structure for three reasons:

1. The idea that "private sector management and thinking (from Merck) could make a significant contribution in the fight against the HIV/AIDS epidemic."

2. Equal partnership with government, because "national commitment was essential for effective intervention"

3. The PPP would invest large amounts and build a comprehensive set of programs that could demonstrate the effectiveness of PPPs. (Ramiah and Reich 2006, 399)

Over most of the first decade of the twenty-first century, the relationship of the government to ACHAP created difficulties in organizational learning and program authority, lessening

2 Social networks and organizational learning

One significant function of organizations is to analyze and manage the flow of information, facilitating an organizational learning process. Organizations that manage their information flows in such a way as to maximize the lessons learned have greater, more

flexible policy outputs (Paxton 2014–15). Not all organizations look the same in terms of their structures of authority (such as what we might see in an org chart), and we can reasonably suspect that the ways that power flows in a public agency, corporate firm, or some hybrid of such will also affect the flow of information. If, as the trope has it, "information is power", then information should track power.[1]

Sociologists and organization scholars have long recognized that in addition to the familiar continuum of anarchy to hierarchy, there is a more general class of organization arrangement: the network. Indeed, some argue that market-anarchy and hierarchy are simply extreme cases of the network form (Podolny and Page 1998a, 59) (Laumann 1991).

According to classic market theory, under a state of anarchy,[2] the competition mechanism provides the information transmitter for actors. More specifically, because the actors in a market compete with one another for the potential rewards available, actors have reason to seek out information on the states and activities of others, as that information will help the actor to adapt to changing circumstances and gain advantage over others competing for the same rewards. Under perfect competition conditions every actor has the same information. Based upon that data, market participants can decide whether to buy, hold, or sell whatever the market is organized around. (Neo-classical rational expectations theory goes further and contends that supplemental information will be encapsulated in the stock price. Cassidy (See, for example, 2009).)

In the development of a public good like health policy and programs, however, competition is often not available as a sorting mechanism, because there is little to no direct profit incentive or specialized information mechanism (like stock price) to direct the seeking out of efficiency and advantage over one's peers. In such a case, provision of information about the operation, value, and utility of the courses of action undertaken by various actors needs to be supplied through another mechanism if the utility maximization and efficiency is a goal of the policy regime. In the resource-poor situations of sub-Saharan Africa and other countries where HIV and other infectious diseases are considerable problems, the component institutions providing and addressing population public health and medical matters are a mixture of NGOs; religious and other charity groups; medical, pharmaceutical, and other sorts of companies; national governments; and international organizations. In the absence of a strong state government, these might exist in some type of anarchy, but since many of these are not under the profit motive, the market

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1. This should hold even if information isn't "objectively" a form or exercise of power but organizational actors *believe* it is.

2. For an anarchical society of a particular form is precisely what a market is.

would be an inappropriate organizing mechanism.

That said, the state is not limited simply to imposing a structure on top of the non-marketized anarchy. The state might decide to set itself up not as a hierarchical system of control. It may choose instead to offer some mechanism by which actors can transact information about the state of policy matters but still be largely left to make their own decisions and take their own actions. Thus, where a hierarchy structure links actors together, as well as allowing some to exercise command and control; and a market structure, in precisely the opposite fashion, treats actors as autonomous with no institutional control one to another; a network structure links actors together, with a degree of control fuzzily[3] intermediate between those observed in the other two forms.

Several analysts argue that the more hierarchical ("vertical" in some parlance) an actor is, it is more likely to perform in an inferior fashion, compared to other forms, in terms of information movement and processing. DeCanio and Watkins (1998), for example, argues that a modicum of control—as opposed to the structural extremes of hierarchy or anarchy—helps to increase the information processing ability of a firm, thus increasing its effectiveness. That is, while hierarchical actors constrain information sharing and anarchical actors are unable to provide stable linkages and sharing, networks that are neither extreme can and do outperform the extremes. Modeling four different forms of the organization, they found that loosening hierarchical connections best facilitates innovation and information-sharing. In particular, the randomly connected firm—where each node is connected to some set number of other nodes but not all of them (and which looks rather like a diagram of a computer network or the Internet)—performs the best over the broadest range of information processing demands; in firms with high information capacities, the completely connected model (every node connected to each other) performs the best.

> The limited processing capability of individuals means that organizations that are able to structure intelligently this internal communications and limit the channels through which their members receive information will have a competitive advantage . . . . While it seems clear that more information-processing capacity is better than less, it is also clear that more raw information can be a barrier to productive change when processing capacity is limited. Also, the question of whether the necessity of structure implies the necessity of hierarchy is open (290).

Analogizing this to a government and its HIV/AIDS response regime, we would expect

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3. In the sense of "fuzziness" used by Ragin (2000).

that two factors should affect the decision timing. First, those governments or government agencies with *higher information processing capabilities* should make a policy decisions more quickly and revisit or reevaluate them more often. Those organizations with flatter hierarchy or whose structure is more dependent upon agent interconnection should behave similarly. Combining both heightened information processing and a more interconnected structure should yield more than either alone.

Scott (2004, 11–12) points out that even a hierarchical organization can seek to improve its position upon recognizing that a particular task lies at the margin of its organizational purview. Rather than seeking command and control that is likely to be "dysfunctional," the better functioning organization is more likely to contract out the decisions and tasks necessary. This will actually provide it more control than "ownership" would, as contracts provide leverage over the decision and implementation process that direct control does not. In addition, as societies become more "rationalized . . . it becomes less necessary to buffer one's own system and more possible to consider connecting it to 'external' systems (governed by the same logic) to pursue objectives" (12). In an organization charged with policy in an area away from its core competencies, we should expect that contracting will provide better returns to investment and success (by whatever metric that is measured) than either direct control or the establishment of new agents within the organization would offer. The state seeking to improve its HIV/AIDS policy where organizational learning is operating should be more willing, then, to operate with partners where and when those partners have particular expertise or experience exceeding the state's own in that area. The learning organization adapts its structure to the warrant of the circumstances.

In terms of HIV policy response, policy response regimes will take longer, be less substantively different, and more resistant to changing when the subject purviews of agent organizations within the state are well-defined and rigid. Garicano (2000); Garicano and Hubbard (2005); and Garicano and Rossi-Hansberg (2006) engage in more extensive formal analysis, positing game theoretic models to examine the relationship among firm structure and decision-process both when knowledge acquisition or knowledge transmission become cheaper and when problems become more complex. In general, where worker knowledge does not overlap, the following holds: as communication (knowledge transmission) cheapens, the organization most optimally becomes "flatter" but individual members have less control in their day-to-day tasks; where knowledge acquisition cheapens, the organization again becomes flatter, but organization members gain more control of their assigned tasks (they are more "empowered," as he puts it). Thus, "when matching problems with experts is very costly, the optimal organization of productive knowledge

has the features of a hierarchy" (Garicano 2000, 897) . In essence, there is not a direct or indirect zero-sum relationship between structural form and agent control; the direction of the relationship differs depending upon a third factor, the cost of *information acquisition.*

So organizational structure tells us about the costs of intra-organizational decision processes. Where the structure is flatter, we'd expect that the costs of information transmission are lesser (compared to an organization that is more hierarchical).

Looking at the cost of information acquisition requires a further examination of worker/ agent autonomy. Garicano indicates that cheaper transmission costs would increase the amount of time required to act, because workers would need to pass problems up the problem-solving chain more, while cheaper acquisition costs allows each worker more opportunity to solve problems on his own. In the end, then, we ideally want to examine three characteristics of policy organizations or policy networks:[4] organizational structure, sub-organizational agent control or autonomy, and the time required to act on a plan. Each of these types of data, where available, tells us something about the cost of information, which in turn affects organizational learning processes.

Thus, states and organizations with greater capacity to govern or oversee societal action should have more hierarchical structure. Resultantly, in cases where a response regime changes over time, such organizations should have larger or more vigorous responses. (On average, it seems likely that those organizations that *can* do more *will* do more.)
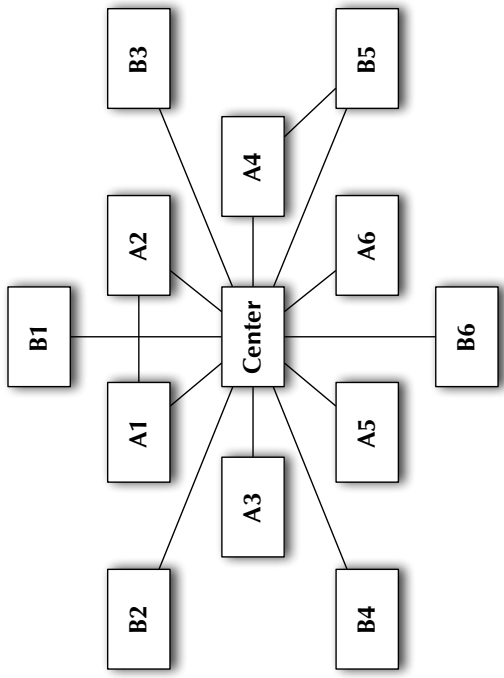
Garicano's analysis seems to conflict with that of DeCanio and Watkins, in terms of the relationship of timing to structure. At the very least, Garicano's hierarchy is an extreme-case contravention of DeCanio and Watkins' contention that structure is necessary for an organization but too much structure is detrimental. While DeCanio and Watkins consider "information processing *ability*", Garicano breaks that concept down into information transmission and acquisition *costs* (emphases mine).

Given the preceding, I expect that the structure of the state organization and/or the arrangement of the various actors (in and outside of the state) will affect the speed and type of response policy implemented. In both the work of Williamson (1991) and Podolny and Page (1998b), networks are understood to be expansive enough to encompass hierarchy/firm and market forms, but more sociological analysts (like Podolny and Page (1998b)) generally separate the three from one another, contending that they represent three ontologically distinct realities for organizations. In Figure 1, I have provided visual representations for each of the forms.[5]
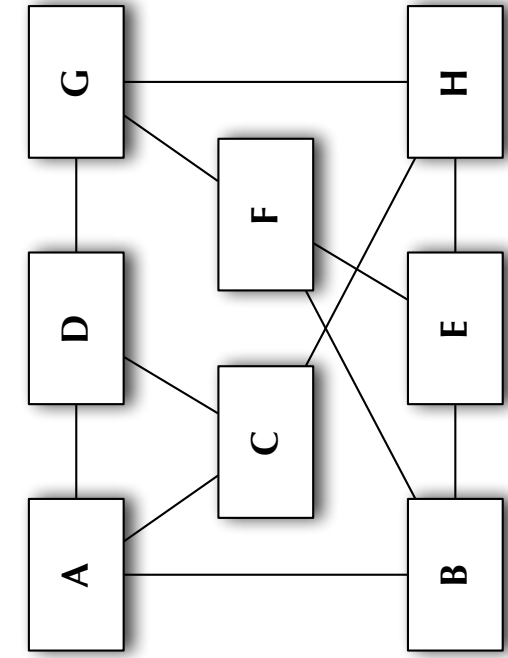
(Networks, of course, can be arranged more to the hierarchical or anarchical pure

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4. For, as we will see, "network" describes these inter-connected but non-hierarchical forms.

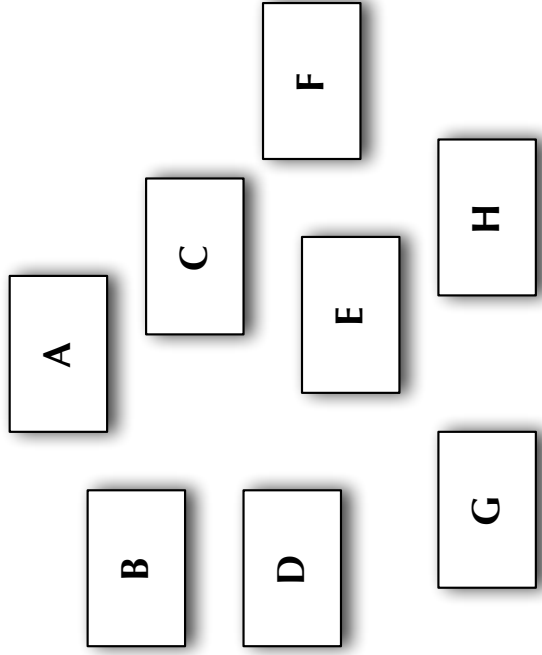5. Two different forms of network, to be discussed below, are shown.

(a) Hierarchy

(b) Centralized Network

(c) Dispersed Network

(d) Market

Figure 1: Different Organizational forms

forms. As against the hierarchical form, units in a network cannot be directly controlled by others as easily as in a hierarchy. There may be some nodes in a network that have more importance or influence than others, but even less influential units can evade some control of those deemed more important, by taking alternate paths through the network to obtain decisions or to transmit information.)

In contrast to the market or anarchical form, network units have connections to one another, and they use these connections to pass information back and forth. This increases the information available in the system at any one time. In anarchical systems, each actor or unit can observe the actions taken by others in the past but does not know what others are planning to do or what current info they possess. In the network, information on plans or current knowledge can be passed around, providing an additional source beyond the observation of past actions. Empirical tests (Hammond 1993) (Hammond, Jen, and Maeda 2007) (Whitford 2002) bear these implications out.

Centrality is the degree to which a node is connected to other nodes in the network when compared to those other nodes. Operationally, one way we might assess centrality is to take the total number of connections a node has, divide by the total possible connections,[6] and compare that number to the same ratio for another node. Greater differences indicate greater centrality.

In 1b, the node labeled "Center" represents an extreme case, in that it is connected to every other node in the network and thus passes information back and forth between it and the A and B nodes.[7] The higher proportion of ties to a node, the more central it is to the network. (The centrality of one node does not obviate the possibility of communication among the other units; thus, for example, the ties between nodes A1 and A2 or A4 and B5 in that figure. In the purest form, all inter-nodal connections must pass through the central node.) In Figure**??**, there is not a central node; each node is connected to three others.

Information travels differently in a network as its degree of centralization increases. In a fully centralized network, to move information between any two nodes (excluding the central one), the information must pass through the central unit in the network, providing that node with access to the information. As centralization decreases, direct connections between two nodes will obviate the necessity of needing to pass information through any

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6. Which is generally $(n-1)! + 1$.

7. The difference between A and B nodes is in their "distance" from the center node; that is, the degree of affinity, constancy of communication, and trust between the center and the affected node. The idea of trust is a common one in the network analysis literature (Podolny and Page 1998a, 60), and "trust" is often identified as a distinctive characteristic of this form of governance.

particular unit. In a network like the one portrayed in Figure 1c, there are a variety of pathways from one node to another. Some of these pathways may require a greater number of nodes and ties to be involved (A to H can proceed via C or via B and E), but if the costs of transmitting information are sufficiently low, the number of intermediate nodes between destinations should not matter.

Therefore, in the case of policy formation, since there is a need not only to coordinate policy information but also to direct policy crafting and implementation, I expect that a more centralized network form will outperform less centralized forms.

2.1 Implications

Because states are not identical, we expect that they will not adopt identical policy mixes or intensities. My explanation argues that, among other influences, information management costs (that is, the costs to acquire, analyze, and transmit information) and state organizational structure form essential components of a learning process; where these differ among states, policy output should also differ. Differences among state-adopted policy mixes against HIV/AIDS can be explained, in part, by the effects that these factors have upon the people drawing conclusions and seeking to persuade others to adopt their conclusions, as this process becomes more or less costly to the organization. More specifically, I expect to see some version of the following:

1. Policy networks should create more policy options than hierarchical or market-like organizational form factors. We expect to see greater output in these cases.

2. Centralized networks (as opposed to de-centralized networks) will optimize the balance between communication and control required to generate policy ideas and then make sure they are followed through.

3. Where information costs are higher, there will be less overall policy output, as resources are diverted from implementation action to information management.

Second, we are interested in the effects that organizational structure has upon learning and decision-making. As noted previously, we can loosely group organizational structures into three categories: hierarchies, networks, and self-organized anarchy (markets). These differ in the degree of control that actors within the system have upon one another. In a hierarchy, there is a clear denotation of subordinates, equals, and superiors. In a market (anarchy), by contrast, all actors are ontologically equal and formally independent of one another. In a network, the actors are not independent of one another, in that they are tied

to fellow actors to assist in the completion of some or all of their functional tasks. But in a network, there is often (but not always) little to no control that the actors have over one another. In a network, we expect that the combination of connections among units and the lack of strict control of each over the other will facilitate a maximum of information, and reduce the information boundedness constraint on rational decision-making.

As I proceed through the following evidence from Botswana, the focus of the narrative will be upon examining *how* decision-makers acquire new information about the HIV/ AIDS epidemic and responses to it and upon *what* the decision-makers do with that information. I will also attempt to ascertain what effects the type of relations among organizational components have upon evaluation and decision.

3 Botswana context

A nation of a little more than two million people, Botswana has been a well-functioning democracy since its independence in 1966. About 60 percent of the population lives in cities, and the capital, Gaborone, has ten percent of the country's population. An abundance for diamonds were discovered after Botswana gained independence from being a British protectorate (Bechuanaland). Economically it is a comfortably middle-income nation, with a 2013 PPP per capita GDP of $16,400 and a growth rate of 3.9 percent, with the diamond industry providing about one third of Botswana's overall GDP (Central Intelligence Agency 2014).

Botswana also has one of the worst HIV epidemics on the planet. In 2007, it had an adult prevalence of 23.9 percent, and as of 2012, the prevalence estimate is still 23 percent. Only Swaziland and Lesotho have higher proportions of HIV-infected members of the population. Botswana's health expenditures as a proportion of GDP are 5.1 percent and have remained around such for the last two decades (Central Intelligence Agency 2014).

Even given its extremely high HIV prevalence, Botswana has generally managed its epidemic well, augmenting generally accepted and recommended policy practices with innovations of its own. Because Botswana is a well-run, stable, democratic, and prosperous society, many of the usual possible confounding explanations for less-than-perfect policy performance will not apply.

By the late 1980s, there were clear signs and indications that the disease was becoming a problem in the country. The overall populations prevalence had already increased beyond the one percent threshold that indicates a generalized (rather than a concentrated) epidemic. Although comprehensive data for Botswana is only available from 1990 onwards

(as we can see in Figure 2), the prevalence in 1990 was 4.3 percent, and it climbed precipitously over the next decade, rising more than 23 percent.
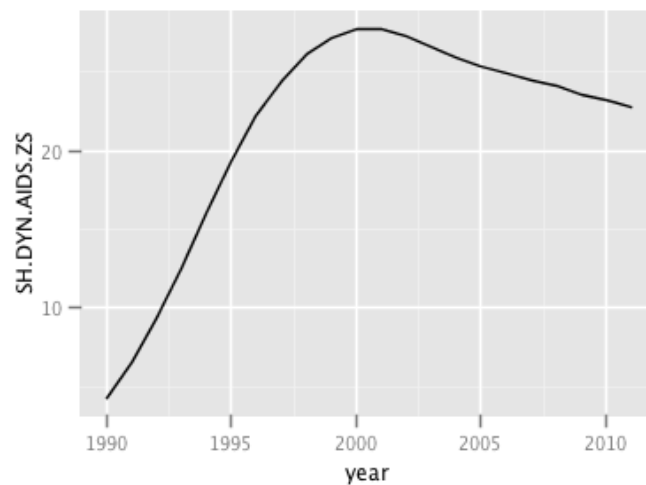

Figure 2: HIV prevalence in Botswana, 1990–2012. Data from World Bank.

In 1988, the government began to move forward on addressing what it had come to realize was a major problem. It solicited the assistance of international experts as it developed surveillance and education campaigns, and the first national mass campaign, involving radio and media, bumper stickers, and t-shirts, took place this same year (Heald 2003, 222). This campaign was not particularly successful. Focusing on the condom as "the central plank," the Batswana people greeted the campaign with "widespread disbelief." The problem was that there was no outward and visible sign of the inward and viral menace. "For the population at large, at this point, there was simply no evidence in the form of morbidity or mortality to support the information on the impending epidemic" (Heald 2006, 33). AIDS even became known as the "radio disease" because the educational spots on radio were the sole experience that people had with the disease (Ingstad 1990). By 1996, however, mortality from AIDS had risen to such a point that great numbers of people had been affected by the results (Heald 2006, 33), although acknowledgment of having AIDS oneself or knowing someone with it remained a source of shame and stigma.

According to Heald (2006, 34), after the initial 1988 campaign, the Botswanan government failed to follow up on anti-HIV campaigns through the mid-'90s; additionally, major international donors pulled out of the country in 1995, ostensibly because Botswana was sufficiently rich among developing countries to finance its own response. (It should be recalled that highly effective treatment programs had not been announced to the world. The affordability of those treatments would take more than five additional years to start

becoming available.) This negatively affected the future response against HIV, even as levels of HIV and AIDS rose to such levels as to no longer be ignorable. Because of the initial ill-considered form and focus of attention and its subsequent lack of follow-up, future campaigns, especially as regarded prevention, encountered difficulty engaging and mobilizing the population. What anti-HIV policy activity that did exist was contained almost entirely within the Ministry of Health, and that ministry was largely left to itself to address the problems of AIDS.

Further action on HIV in Botswana would take at least a decade to get going again.

Public-private partnership has been an important component of the national response since the country renewed serious attention to the disease under President Festus Mogae (1998–2008). Although there had been signs that the HIV epidemic was on the increase in the late '80s and early '90s, Figure 2 shows prevalence quadrupling between 1990 and 1995, with a peak prevalence of 27.7 percent in 2000 and 2001.

At this key time in the country's response, Botswana undertook two organizational innovations to address its crisis. These would eventually work at cross-purposes to one another, impacting both organizations ability to engage the crisis. The structure of this relationship detrimentally affected the processes of organizational learning—the process of sharing information, analyzing it, and resultantly expanding policy options (Huber 1991, 99); (Paxton 2014–15, 3–8).

4 Actors Involved

Before proceeding to deeper analysis, I briefly outline the major actors involved in the formation and setting of Botswana's HIV policies, primarily in the time period from 2000–2008. The Botswana HIV response has been built from a combination of public and private sector components, generally in partnership with each other. Through the partnerships that the government of Botswana has set up or become involved in with private and semi-private entities, it has greatly expanded, beyond previous levels, its treatment and prevention programs.[8] Most, if not all, of the decision-making and program delivery in Botswana has occurred either through or under the delegated auspices of these public-private partnerships.

> . . . [T]his tiny country formed novel partnerships with leading universities,
> pharmaceutical companies, foundations, and developed country governments,

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8. As we will see, this does not mean that such programs have been regarded as adequate or entirely successful.

which have provided generous funding, state-of-the-art equipment, training, and expertise (Cohen 2008, 526).

The treatment programs, especially, have scaled up tremendously, setting an example for all sorts of other countries. Everyone who needs anti-HIV drugs receives them, free medical care is relatively easy to access, and PMTCT[9] programs have been widely (and successfully) implemented (526).

Beyond treatment, other long-term efforts have been established. In the 1990s, Botswana's government partnered with biomedical scientists from Harvard University to develop a laboratory for testing, monitoring, and surveillance activities. "The first of its kind anywhere in Africa, the laboratory, with a staff of 50, is equipped with gene sequencers and blood cell sorters, enabling scientists to keep track of the spread of HIV, especially the HIV–1C strain prevalent in Africa" (Rollnick 2002, n.p.). In an interview with the founder of the Harvard Botswana Partnership, he indicated that health and education authorities were particularly willing to consider translating bench or epidemiological research into pilot policy programs.

Because the emphasis of this paper is upon the role that organizational elements have played with respect to each other, I consider several of these organizations in turn, sketching out their individual and partnered contributions to the national HIV response. In general, the discussion proceeds entity by entity rather than chronologically.

4.1 Government

The most important actor in the Botswana response to HIV has been the domestic government. Although the government has worked with a variety of other actors over the course of the last decade and a half, it has guarded its prerogative to set and direct the domestic HIV policy regime.

The structure of an organization's elements, as well as how different organizations are related to each other, can tell is about the flow of information within and among organizations, indicating the extent to which the organization or set of organizations may learn and draw lessons from experience. The Botswanan portrayal of the organizational arrangement of its AIDS policy organs shows elements of both network and hierarchical modes of organization, but the portrayal, expectedly, leaves out a focal element that quickly became important.

In August 1999, President Festus Mogae (who had been taken office almost 2 years earlier) re-launched governmental efforts to combat HIV/AIDS in Botswana. Since the

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9. Prevention of Mother To Child Transmission

advent of highly active anti-retroviral therapy (HAART) three years earlier, the anti-HIV drugs had been used to great effectiveness in the developed world, bringing some AIDS patients back from the brink of death. At the time, Botswana had one of the very highest prevalence levels in the world.[10] President Mogae thus argued that the very first priority of the government was to take care of the portion of the population — between one-fifth and one-fourth — infected with HIV, especially those who had clinically progressed to AIDS.

Botswanan officials, particularly President Mogae, recognized that the anti-AIDS effort would have to be better managed, with attention paid to continuity and follow-up, to prevent the policy failure that had occurred a decade before. For the first ten to fifteen years that HIV was present in the country, it had been dealt with as an STI and then as a more general health problem; toward the end of the '90s, officials "realized it was more of a developmental problem" and that HIV/AIDS should be addressed through "more of a multi-sectoral approach" (Molomo 2008). They thus sought the assistance, technical and financial, of potential partners outside the country.

Figure 3 puts the National AIDS Coordinating Agency (discussed in more detail in the next section) at the hub of a cluster of societal sectors and government ministries, departments/agencies, and committees. Is it subordinate to the National AIDS Council, which in Botswana was chaired by President Festus Mogae, and it receives and broadcasts information from every source. In terms of the theory above, it is the hub of a centralized network of actors working on HIV in Botswana.

NACA was formed in 1999 through presidential decree, and from the start it was "given responsibility for mobilising and coordinating a multi-sectoral response to tackling the epidemic, including engaging the private sector" (Wilson 2007). NACA began its programmatic activities in January 2000 (Rollnick 2002).

In its first two years of operation NACA experienced severe shortages of trained staff, especially medical staff. Like ACHAP, hundreds of lay personnel were trained to make up the differences, performing tasks that did not strictly require doctors or nurses, such as post-test counseling (Rollnick 2002).

According to two Botswana officials (Molomo 2008) (Malthare 2008), NACA's role is to "provide the policy environment" that will "encourage and promote partnerships" to address the country's AIDS challenges. To this end, NACA creates strategy plans for the policy overall; oversees the implementation of those plans with monitoring and evaluation protocols; and it directs and advises "everyone else" as to the emphasis of HIV efforts

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10. Botswana had the anti-distinction of being number one or number two, depending on the accuracy one imputes to the statistical calculations.
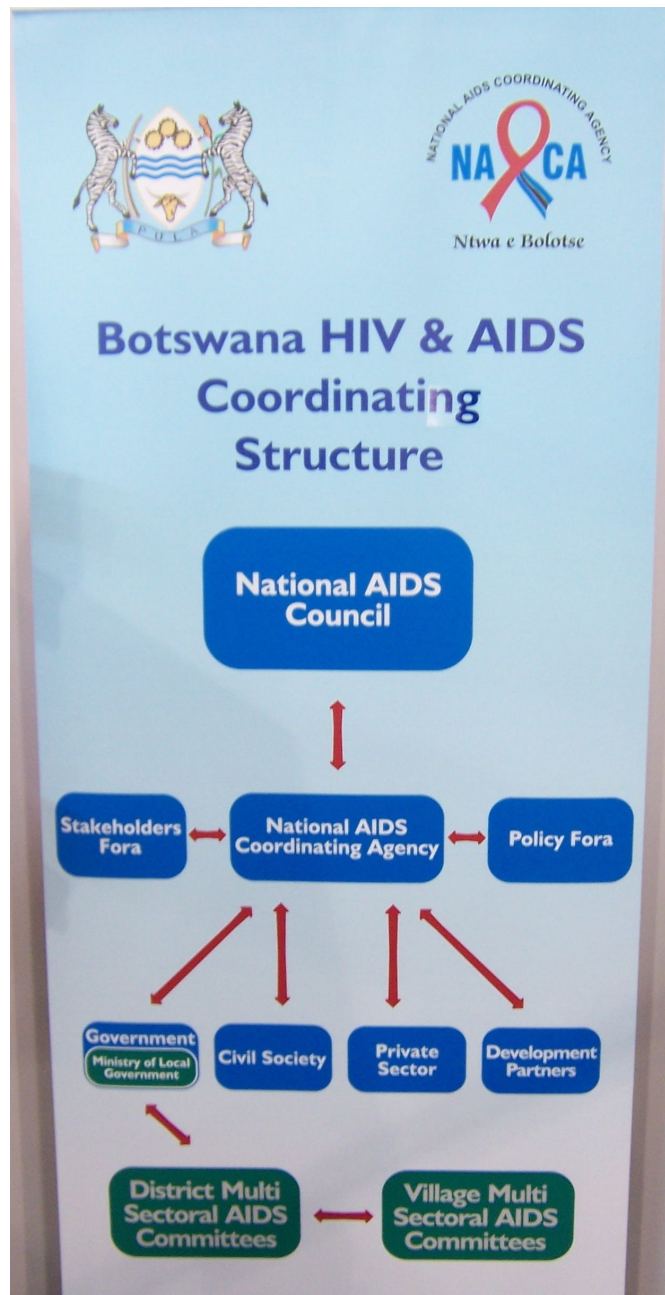
Figure 3: The national HIV policy structure, as portrayed by the government. Photo taken at XVII International AIDS Conference, 3–8 August 2008.

and which sorts of efforts should be sustained. That said, NACA is "more like a point of convergence" than anything else.

As we can see in Figure 3, although the National AIDS Council formally supervises all aspects of HIV/AIDS policy and "outranks" the other entities portrayed, its role is primarily to provide a national consultative and goal-setting body, containing representatives from various portions of the government, "parastatal" organizations, labor, industry and commerce, the NGO sector, the University of Botswana, the police, military, religious and women's representatives.[11] Most of the real work of policy proposal, analysis, persuasion, presentation, and supervision actually occurs in the National AIDS Coordinating Agency. The Botswanan government presents a picture of HIV planning and management that has the National AIDS Coordinating Agency (NACA) in touch with and assisting all levels of government — national, regional/provincial, and local. Indeed, in several interviews, respondents noted that NACA's role was to provide a consultative and coordinating function. (Some respondents were criticizing NACA to say that it had not done enough in these roles, that its focus had been divided away from them by also doing resource allocation and management.)

Botswanan bureaucracy is, to put it colloquially, quite intense. "'The irony in Botswana is that part of the problem is the inheritance of the British civil servant's approach,' says [Harvard public health professor] Michael Reich . . . . 'Some people say they're more British than the British.' " (Cohen 2008, 528). Botswana's tortured bureaucracy is a function of the overlay of the colonial governing apparatus onto indigenous elements of leadership. The councils of chiefs, reliant upon traditional sources of authority, exist primarily at the local level, and their power overlaps with regional and local bureaucrats.

This tradition of extensive bureaucracy, a culture of consensus-building, and the small population, several interviewees said, means that action does not move fast in Botswana government. Because the country and the government have historically had plenty of income to meet overall needs—at least until the HIV epidemic—civil society institutions are not extensive, large, or well-developed.

Virtually every other element of the Botswana government became involved in the fight against HIV, because the virus threatened every aspect of the country's life. NACA was placed, administratively, within the Executive Ministry of the President, signaling Mogae's high priority for the agency and its mission. Taking that mission away form the Ministry of Health, however, created "resentment" and "confusion" (Interview PB4)

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11. It is unclear when this version of the national organizational structure became the one presented. As of the 2012 International AIDS Conference, the Botswanan delegation was using the very same display poster.

and led to turf wars. NACA had budgetary control of the HIV response, which led to conflict with the Ministry of Finance. Because NACA needed to implement programs on very local levels, to distribute drugs, health care workers, and so on, it also had to deal with a multiplicity of local governments, bringing it into the purview of the Monistry of Local Government. One interviewee also said that the heads of NACA and the Ministry of Health in those initial years "were mortal enemies" (Interview R11). Given the complicated structures of either **??** or Figure 4 combined with these bureaucratic and personal animosities, moving information, persuading actors, and expanding the range of policy options might daunt the toughest of political actors.

4.2 ACHAP

The African Comprehensive HIV/AIDS Partnership (ACHAP), established in late 2001, is a "public-private collaboration between [sic] the Government of Botswana, Merck, and the Bill and Melinda Gates Foundation." It is designed to be "a comprehensive program of HIV/AIDS prevention, treatment, care, and support in one country in sub-Saharan Africa. …[—] a pilot program, which — if successful — could provide guidelines for other developing nations, for international organizations, for foundations, and for the governments of developing countries that ultimately would have to bear the tremendous cost of any comprehensive plan" (Distlerath and Macdonald 2004, 150, 148–49).

ACHAP did not start out upon the initiative of the government of Botswana. It grew out of Merck Pharmaceuticals's "experiences with other philanthropic projects on access to medicines …." Merck had been previously involved in programs to donate medicines for both HIV/AIDS and for onchocerciasis (river blindness). Because of this previous experience, Merck thought the simple donation of medicine was neither sufficient nor helpful "without support for strengthening the health care infrastructure to assure that medicines [would be] used effectively" (Ramiah and Reich 2006, 399).

Merck entered upon the course of setting up a "public-private partnership" because it had prior experience with the model and because the company believed that private enterprise could bring entrepreneurial innovation to government thinking.

ACHAP's relationship with the government was initially marked by a lack of clarity as to the division of labor and lines of authority. In the first year of existence and activity (2001), Ramiah and Reich (2006) identified key problems in the relationship between ACHAP and the government, which essentially boil down to a lack of definition in the relationship and its workings. ACHAP's two primary partners (or stakeholders) were the government of Botswana and Merck Pharmaceutical. (Ramiah and Reich (2006, 401)

note that the Gates Foundation played a limited role, as part of its "general approach to grantees at the time.") But each actor located ACHAP's operating authority in a different location, and this led to conflict over how best to run ACHAP, who had a say in its operations, and what should be done with its vast resources. For the government, the framework agreement establishing ACHAP indicated that the Botswanan state would be an equal partner with Merck; Merck saw operating authority as vested in the ACHAP board of directors, which contained no government representatives, including only members from the private side of the partnership (Ramiah and Reich 2006, 401–402).

This led to a division among the actors (eventually including the Gates Foundation) over ACHAP's level of oversight in the overall national HIV/AIDS response, as well as in the intended recipient of the partnership's largess. The government expected, to a large extent, that it would remain in charge of programs and spending within Botswana. "The government interpreted 'support' to mean that the ACHAP board would donate the necessary funds and then leave implementation to government agencies" (401). Merck understood ACHAP to be partnered with but independent of the government, and it was committed to integrating the entrepreneurial thinking of private enterprise into whatever processes or programs it was involved in; as such, it expected that ACHAP would not simply serve as a relatively passive source of funds but as an active authority and expert implementer of programmatic responses.

Moreover, in the initial period, it was unclear what ACHAP would do with the (relatively) massive $100 million (for five years, initially) at its disposal. This money contributed to the partnership's perceived power to drive HIV/AIDS policy choices, a power that the government resented and NGOs envied.

(ACHAP's major problem has never been money. Its initial funding, from Merck Pharmaceutical and the Gates Foundation, was for $100 million. By 2005, the partnership had only spent a bit more than half of that amount. The problem proved to be "absorptive capacity." As the Gates foundation said in 2006, "'we underestimated just how hard it is to build up the systems necessary to confront HIV/AIDS across an entire country"' (Cohen 2008, 528).)

Thus, over this first year, two elements of the HIV/AIDS response structure contributed to its output and efficacy. First, ACHAP's role vis-à-vis the government—that is, what the basis of the relationship was—was not defined in a sufficiently concrete way that all partners had a shared perception of their roles. Second, within ACHAP itself, because it was an organization just getting off the ground, its own internal structures and operations were still undergoing definition and settlement. Although Merck had experience in creating other public-private partnerships, each had to be individually adjusted to the

local government, conditions, and relevant health crisis.

Combined, these two structural elements served to set up competing hubs in the network of HIV/AIDS agencies and providers: one in the Botswanan government/NACA and one in ACHAP. Because there was conflict over their roles, for government ministries and NGOs, it was unclear with whom they should be working to develop and fund their programs.

The organizational structure of the set of actors dealing with the HIV/AIDS crisis in Botswana initially had an effect upon the policy environment. For government agencies, there was a lack of clarity over whether to deal with NACA or ACHAP: while NACA was an entirely governmental entity (as opposed to a partnership with private actors), ACHAP had much greater resources at its command. Most governmental ministries and agencies ended up dealing with NACA, as it was the official government response entity for the epidemic. They missed out, then, upon the process innovations that ACHAP was able to bring into programmatic responses, which provided access to ideas and information not normally available to the government, as they came from private sector entities. For NGOs, the problem was determining who was in charge, so as to receive authorization and support for the range of their activities. Nominally, the government was in charge, but with its involvement in ACHAP, it was unclear whether an NGO should access officialdom via the purely governmental organ or by the partnership one with superior resources. In sum, in the period of both NACA and ACHAP's establishment, each was developing its own network[12] of Botswanan AIDS actors; with the possible universe of those actors being both finite and essentially identical, each hub competed with and largely duplicated the other.

Not all of what ACHAP faced at its inception were institutional difficulties. Some of the problems that ACHAP (or any similar entity would have) faced in 2001, upon its inception, were significant politico-economic ones. The most prominent problem proved to be the need for a massive increase in the numbers of health professionals to simply execute the day-to-day tasks involved in a mass HIV treatment program. A study by the McKinsey consulting group estimated the need for a 29% increase in doctors, 115% in lab technicians, and 179% in pharmacists (Cohen 2008, 528).

Matters did not improve in the subsequent two years of ACHAP's partnership with the government. Several sources focus on the partnership's executive director as a source of problems in ACHAP's relationship with the Botswanan state (Ramiah and Reich 2006), (Cohen 2008) (Heald 2006). The first director of the program, Donald de Korte, came from the ranks of Merck, having headed up the company's operations in South Africa,

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12. I use this word specifically, in contrast to a "market" or "hierarchy".

and he had a hard time working with counterparts and functionaries from within the Botswanan government, who claimed he did not understand the country's "culture of consultation". He responded that such a "culture" was actually a cover for bureaucratic slowness and inaction (Cohen 2008, 527).

Moreover, it appeared that the government was not the only actor at fault in the proliferation of an HIV/AIDS bureaucracy. Even in the first years of the Botswanan response of the '00s, major donors, IOs, NGOs, and other aid agencies saw the country as a near-ideal test case for whether anti-AIDS programs could be made to work in highly affected countries. So Botswana quickly became "a land of acronyms, with a mosaic of programmes and agencies criss-crossing one another" (Heald 2006, 36).

A lack of clarity over ACHAP's role continued to hinder it in 2002 and even into 2003. "One source of tension in ACHAP's second year was a growing concern that ACHAP was overstepping its role as facilitator and becoming an implementer" (Ramiah and Reich 2006, 404). In blunt terms, ACHAP continued to deal poorly with various portions of the government and it failed to recognize the consequences that might be expected. One manner in which this manifested was ACHAP staff dealt with senior government officials, but failed to cultivate and confer with mid-level staffers in NACA and the ministries. Thus, for example, when ACHAP embarked on one of its first projects — providing funds, facilities, and technical support to ramp up the national ARV response — the lack of involvement of implementation-level officials in previous negotiations meant that key agencies were not informed, drawing out the bureaucratic process and finally requiring the president to intervene to get matters settled (402–03).

ACHAP moved to become less of a facilitating entity and more of an implementer, and in the process, NGOs and the government both believed that the partnership was becoming less of a true partnership and more pushy and dominating (404). ACHAP was now perceived not so much as a separate entity; it was, instead, seen primarily a face of Merck, with Gates and the government as accessories or partners in name only.

This changed, however, in ACHAP's third year, 2003, as the Gates Foundation changed its approach to grantees, taking a more active role in their operations. In doing this in Botswana, other actors' perceptions of ACHAP changed, as it was no longer seen solely as a creature of Merck. Moreover, ACHAP had engaged in its own learning process regarding some of the problems it was having in putting programs in place, identifying them and then taking steps to reduce or eliminate those. For example, with de Korte's rocky relationship with both the head of NACA and with Botswanan government officials, special efforts were made to foster better relations between the two men and, after further conflict over the need for "consensus-building", de Korte left ACHAP. Further, ACHAP

worked to engage mid-level policy implementers, looking for ways to speed up processes without stepping on toes. Thus, when ACHAP became involved in scaling up the national ARV program by helping in the construction of ARV treatment clinics, progress was considerably faster; where the government estimated that on its own it would take 18 months, ACHAP was able to complete the job in 3 months (Ramiah and Reich 2006, 404).

By late 2003, ACHAP's relationships had evolved considerably, and it was an integral part of the Botswanan portion of the UN's "Three by Five" program to get three million people worldwide on ARVs by 2005. More relevant to this analysis, ACHAP had taken steps to learn from the experience of the past and to put in place measures to facilitate future learning. In addition to the staffing changes described above, in 2004, ACHAP and the government agreed to clarify their roles with regard to issues around funding and program oversight. (One of the government's chief objections over the previous three years had been that it had no input on ACHAP's funding decisions, as all these were made by the partnership's board of directors. ACHAP, wanting to partner with but remain independent from the government, had resisted putting a government representative on its board.) A separate funding committee was set up that included a representative of the government, giving the state a more direct line of input into how funding decisions would interact with and impact the government's non-ACHAP programs and partnerships or relationships with other anti-HIV organizations.

The result of these changes resulted in positive news for both ACHAP and Botswana. Whereas at the end of 2003, both Merck and Gates had "expressed reluctance to provide financial assistance beyond the initial $100 million commitment" or to provide organizational support past 2005, by late 2004, Merck and Gates were sufficiently happy with the changes made that they agreed to extend support for five further years and to fund the remaining $56.5 million (405–06). Cooperation has marked the relationship since that time, and ACHAP has become the major partner with the government in its treatment effort, as well as the biggest funder of the same.

5 Government structural challenges

As outlined above, where the arrangement of the organization facilitates two-way flows of information (at least in a network or hierarchy), we should see localized initiatives, innovation transfers, and greater programmatic output, especially with respect to programs that rely on distributed leadership — like school education units, peer educator counseling workshops, or behavioral accountability partners/micro-networks.

But if there is "too much" hierarchical control, we would expect developed and implemented programs at the national level but a fairly constrained set of programs, not extending much beyond mandate, as we process down the levels of government. Two primary reasons cause this, the theory predicts: first, the highest authorities in a hierarchical system are reluctant to allow activities that they do not authorize; second, without much autonomy, lower-level authorities do not have sufficient exercise of their own authority and experience to motivate them to "buy-in" — if it seems less likely that higher authorities will hearken to the conclusion that locals draw from their own experience (i.e., what locals learn about the effects of context on a standard program), locals are more likely to do only what is denotatively required and not more. Similarly, the "market" organizational model can cause problems when it becomes dominant, and we would expect a lower programmatic output overall. In such an organization, information can be quite easy to pass around; under a perfectly operating market, of course, all actors have perfect information with respect to one another. Without some units to exercise formal authority over each other or some commonly shared motivator, however, there is no coordination of efforts. In a political system, lacking profit as motive, actors do not necessarily have a common goal. Without something to provide focus and offer rewards for effort, the policy system can grow chaotic in direction and output. The lack of a fixed incentive like profit leads in a marketized organizational system to duplication of efforts or to policy paralysis as conflicting efforts cancel one another out. If some form of fixed reward can be offered, whether that is an element of the Thucydidean trinity of power, profit, and prestige, or whether some other accruing resource, the market could be made to work. In policy creation and implementation, this is harder to find or define than when playing stocks.

When examining the basic arrangement of the Botswana response, one may be forgiven for difficulty in discerning the form of organizational arrangements. In Figure 3, there appears to be a network with NACA as its primary hub. There is some degree of hierarchical control, as the National AIDS Council officially supervises the work of NACA,[13] and the national government provides support and supervision of the district and local multi-sectoral AIDS committees.

Upon examining Figure 4, however, the picture becomes more complicated, and the

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13. "Botswana is among the 19 African countries that have established a National AIDS Council chaired by the head of state to take responsibility for a multi-sectoral response to AIDS. The National AIDS Coordinating Agency provides technical support to the National AIDS Council and coordinates the national health sector response. Activities are guided by a National AIDS Policy and the National Strategic Framework for HIV/AIDS for 2003–2009, which was developed to foster an expanded multi-sectoral response." See (World Health Organization 2005).
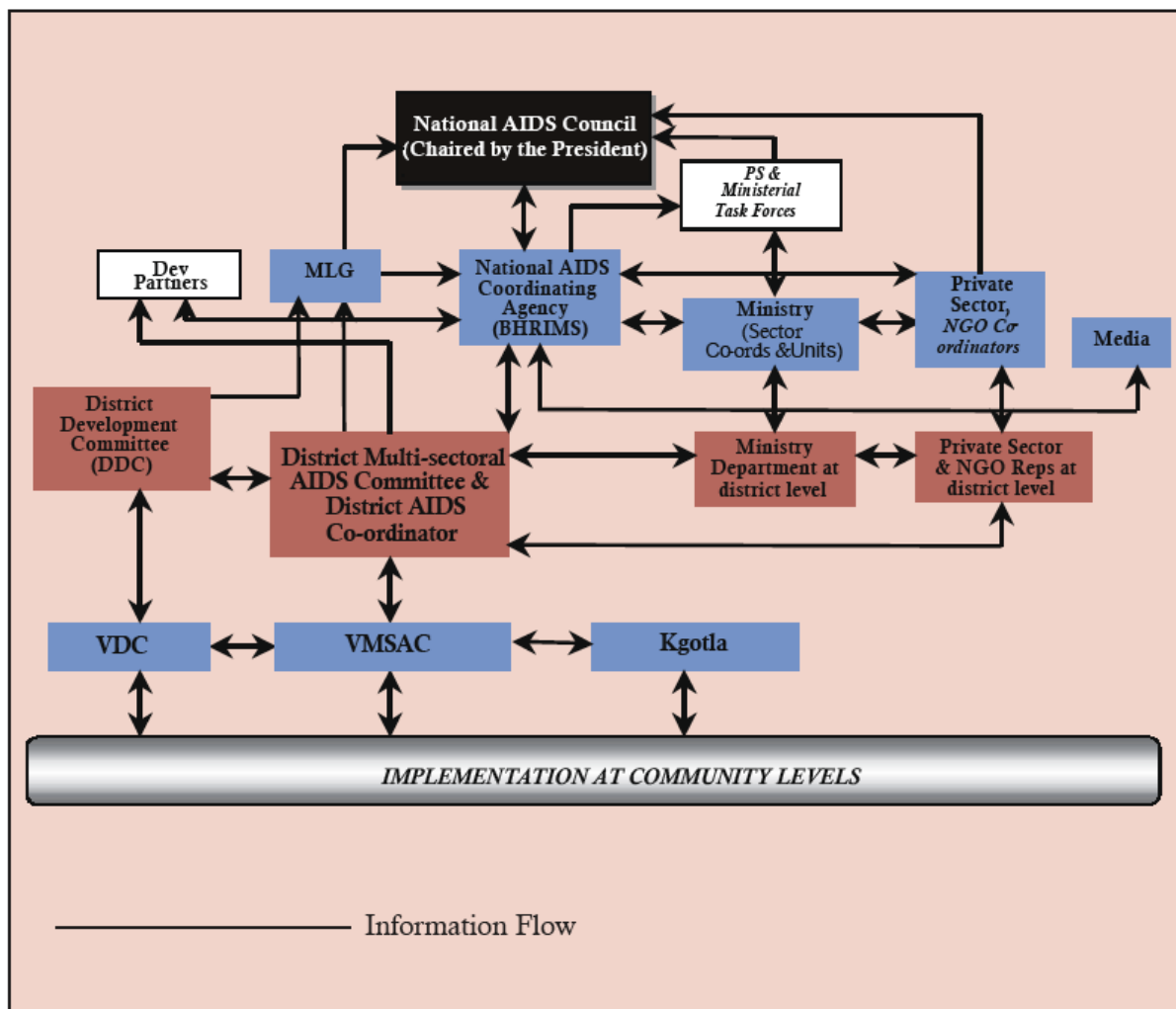
flow of information more complex.

Figure 4: A more elaborate view of the national HIV structure and its corresponding information flows. Taken from Botswana National AIDS Coordinating Agency (2003, 91).

In Figure 4, the arrangement of response units is less clear, at least vis-à-vis the relationships that the designers expect them to have with one another. Although the figure could perhaps use better graphic design, a basic problem still remains: every unit is in information contact with so many other units that policy and information coordination and direction in such a system would be relatively difficult. The only authority in this system is the nominal authority of the National Council, which is meant to be a high-level decision-making body and lacks the resources to consider, evaluate, and sift through every bit of information that may exist in this system. The management style here is "flat"; as such, it might facilitate the flow of information and new ideas, but it lacks filters

and decision-makers. In addition, because there are so many conduits for the movement of information, it becomes unclear where to persuade whom into expanding the menu of policy options.

Five years passed between the presentations of the two views of the national HIV structure shown here. The more complicated one (Figure 4) comes from the framework document outlining the country's planned strategy for fighting HIV/AIDS in the period 2003–2009. The National Strategic Framework represents both the state of anti-HIV efforts in 2003 and the directions planned for those efforts in the future, and the national HIV structure diagram is similarly a representation of present and future. According to mid- and high-level individuals interviewed during and after AIDS 2008, the schematic in Figure 3 represents the government's current understanding and practice, especially as regards the role of NACA. Molomo (2008) especially emphasized the role of NACA as coordinator of efforts, but—in descriptions of the way that various stakeholders and government agencies interacted with NACA—other interviewees (generally) backed up this assessment.[14]

In either case—whether the organizational arrangements became simplified over time or that the later diagram is a presentational simplification—the response structure also had to contend with another difficulty.

6 Relationship between NACA and ACHAP

In the early 2000s, some of the effectiveness that the response might have had was lost due to having two focus points for action: NACA, which was entirely a government response, and ACHAP, which was a public-private partnership with the government as half of the whole entity.

Both in the research of Ramiah and Reich (2005) ; Ramiah and Reich (2006) and in interviews of individuals working with or in NACA, it appears that the tension between NACA/the government and ACHAP contributed to a diffusion of efforts. For example, one of the first policies that Botswana needed to put together was obtaining and delivering anti-retroviral (ARV) therapeutic drugs to HIV-positive people. In 2001, widespread ARV provision was regarded as unadvisable, even in a middle income nation like Botswana.

However, Botswana's high HIV infection rates presented a strong argument

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14. Most notably, in an interview with science journalist Jon Cohen, he argued the opposite — that NACA was not particularly important in understanding the Botswanan AIDS response; he thinks that it can largely be explained through the personal action of President Mogae. Future research is indicated on this point to settle the matter more definitively.

for initiating such a program. Several subpopulations have prevalence rates that exceed the 37.4 percent rate found in the general adult population.9 In addition, of the 300,000 people infected with HIV in Botswana, approximately 110,000 are estimated to have CD4 counts below 200 and are thus considered medically eligible for ARV treatment (Ramiah and Reich 2005, 546).
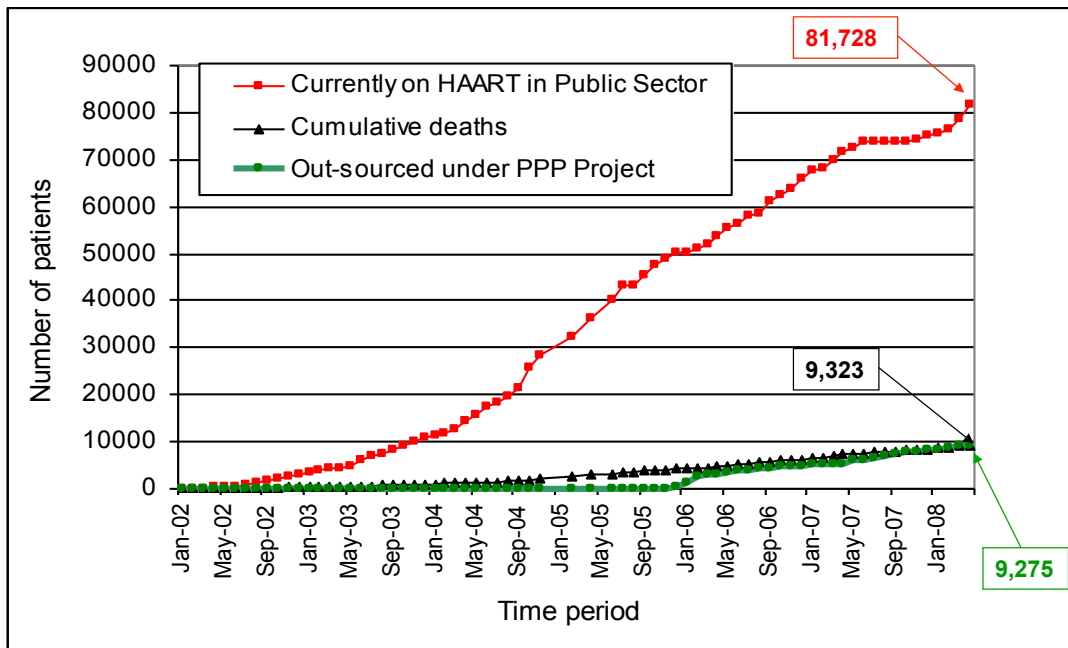
This would seem the perfect opportunity for the PPP to work, uniting global health's major philanthropic force, a multinational pharmaceutical corporation, and the government of a democratic, technically capable, and relatively (regionally) rich country. ACHAP started out with total cash resources of $100 million ($50 million each from Gates and Merck), and Merck had also agreed to donate its first- and second-line ARV drug combinations. The availability of the Merck drugs, plus the PPP's funding provided the confidence to begin implementing the national ARV program.

ACHAP proved instrumental in helping the government start the ARV program, including engaging the McKinsey & Company management consultants to examine the feasibility of the program (Ramiah and Reich 2006, 402). Even with this initial success, however, there was indication and intimation on the part of some that the Botswanan government/NACA and ACHAP were not entirely aligned. As one informant said, ACHAP was making its own interpretations of policy advice from UNAIDS and operating "pretty much in parallel" with NACA (the government). "ACHAP (subsection 4.2) were quietly the people putting the [anti-retroviral therapy] policy together." (Interview PB4) As we can see in Figure 5, the government conducted the bulk of service provision and medical care for ARV therapy. Outside consultants FSG, brought in to evaluate ACHAP after 14 years of activity, concluded, "Supporting the growth of ARV treatment has been ACHAP's greatest success and is perhaps the best example of how the partnership adapted and learned based on the changing context ..." (FSG 2014, 33). Of greatest innovation in addressing the challenge of distributing drugs widely and quickly, ACHAP helped develop a "decentralized" system of clinics for testing and treatment of HIV. (See Table 1 for greater detail on ACHAP's contribution to the Botswana ARV program.)

Several sources including interviewees and outside consultant evaluators argued that two factors above others created a tension between the government and the PPP. First, the structural and managerial relationship of the government to the other two partners was unclear, in that the government's role was minimal. Second, the sheer volume of resources that ACHAP brought to the country led to confusion around the PPP's objectives and role in funding components of the national response.

The interface between ACHAP and the Botswana government took time to figure out. When ACHAP was established, its board of directors lacked representation from the

HAART Patient Update in Botswana: April 2008

81,728

90000

Number of patients

- ■ Currently on HAART in Public Sector
- ▲ Cumulative deaths
- ● Out-sourced under PPP Project

80000
70000
60000
50000
40000
30000
20000
10000
0

9,323

9,275

Jan-02 May-02 Sep-02 Jan-03 May-03 Sep-03 Jan-04 May-04 Sep-04 Jan-05 May-05 Sep-05 Jan-06 May-06 Sep-06 Jan-07 May-07 Sep-07 Jan-08

Time period

Private Sector – 9,514

Total on HAART in Botswana –100,517

Figure 5: Highly Active Antiretroviral Therapy Recipients in Botswana, April 2008. Source: Botswana Ministry of Health, Harvard Botswana Partnership.

Government of Botswana, and the primary way that it was supposed to coordinate and communicate with NACA. However, in NACA's early years, its overall place in the scheme of the government was not clear. ACHAP often had to appeal to the president himself to help it cut through bureaucratic animosities and structures. This intervention via the President likely had a dual effect: first, it undercut the designated priority and centrality for NACA that President Mogae had provided it; second, it isolated and antagonized ACHAP's entry point for working with the government.

The money that ACHAP had at its disposal was massive, even in the context of one of sub-Saharan Africa's most well-off countries. In current dollars, the central government's annual expenditures in 2000 and 2001 were between about 300 and 340 million dollars; ACHAP's funding was equal to one third of the country's annual expenditures on all health, not just HIV. According to several interviews, it was not simply the size of of ACHAP's resources in this context but that ACHAP "threw around the weight of $100 million too much" (Interview R1). The government, for its part, tended to see ACHAP as primarily a donor institution that should provide funding for government initiatives and priorities, following the government's lead (Interviews R4, R8, R12).

These two factors—the nature of ACHAP's partnership with the Botswana government and the amount of resources that it brought to the HIV crisis—created a divided understanding of who held authority to set HIV priority and policy regimes. While the government generally and NACA specifically held formal authority, those working on the Botswana epidemic recognized the agenda-creating or -altering power of money. Because of this, ACHAP could not be ignored.

The uncertainty that having two centers of policy discussion and coordination fostered led to a greater share of the available but finite resources of time, expense, and effort being used to figure out who to talk to and what was going on than if there had been a more clear center. Importantly, one sees the manifestation of this cost in two sets of facts. First, much of the first two year's of ACHAP's existence were devoted to sorting out the relationship between the partnership and the government and which entities would be involved in what decision-making. Second, once these issues were sorted out in 2004, the pace of work coming from the government, either via NACA or from President Mogae, did increase. For example, from 2004 onward—with the advent of the RHT program and the step-up of ARV therapy distribution—the government (by itself or in partnership) accomplished more than in the previous period. While there should be hesitation to infer that the costs of uncertainty are the sole cause for this change, the coincidence of timing, as well as the judgment of informants, provides evidence for the theory's assertion that the structural relationship of the involved organizations affected outcomes.

In addition, starting in 2004, ACHAP initiated the Madikwe Forum, which was an attempt to bring ACHAP directors and high-level (Cabinet level and Permanent Secretaries) government officials together three times per year. This "helped the ACHAP board members and government officials to build a useful foundation of trust and coordination ..." (FSG 2014, 55–56). For a few years, Madikwe facilitated the work between ACHAP and NACA. "The Madikwe Forum allowed for the participation of government, but did not give the government direct control. ... [It] represented a balance between coordination with government and alignment of priorities on the one hand, and independence and flexibility of execution on the other." (56) Over time, however, the Madikwe Forum lost effectiveness, as government and ACHAP priorities and interests diverged, and as ministry permanent secretaries began sending subordinate and delegates to meetings.

7 Conclusion

The public-private partnership form provided Botswana with a way to coordinate the actions of international donors and for-profit entities with the anti-HIV strategies of the national government. While the resulting entity—the African Comprehensive HIV/ AIDS Partnership (ACHAP)—became an essential component of the country's response. ACHAP brought Botswana's government private-sector expertise and flexibility along with significant connections to rich country financial and pharmaceutical resources.

This paper theorizes that the structure of an organization or a collective of organizations will affect organizational learning and thus decision making. Drawing on network organizational theory, I postulate that networked conglomerations with a moderate degree of hierarchical authority best balance the need to exchange and share information with the need to make decisions.

In the case of Botswana, the National AIDS Coordinating Agency (NACA) came from presidential directive, and it suffered significant problems of coordination and authority during its first few years of existence. ACHAP became an alternate XX of influence and policy innovation. For those working to implement anti-HIV policy programs in Botswana, this implied a division in the decision-making authority.

Having two locations of decision authority diverted the shape and direction of the fight against HIV. The unintentional division brought about by the dual existence of NACA and ACHAP lessened the country's action against HIV during a critical period in the response to the disease.

Table 1: ACHAP contributions to the ARV program. Source: adapted from Ramiah and Reich (2006).

Aspects of the ARV program	ACHAP contributions
Policy, planning and project management (central and facility level)	Recruitment and salaries of key staff
Information, Education and Communication (IEC) and community mobilization	Recruitment and salaries of key staff
Training of health professionals (in ARV therapy, IT, monitoring & evaluation)	Financial support for KITSO, management and financial support for preceptorship program, recruitment and salaries of some key staff for monitoring and evaluation and IT training
Healthcare worker recruitment	Recruitment and salaries for up to 52 healthcare workers for a period of two years
Drug logistics	Donation of two ARV drugs (Stocrin and Crixivan) from Merck
Laboratory and testing logistics	Financial support
Information technology for nationwide tracking and monitoring of patients, laboratory samples and medication utilization	Financial support for purchase and installation of hardware, recruitment and salaries of key staff managing the program.
Procurement and upgrading of space for provision of treatment	Contracting and financing the building of 16 clinics for ARV treatment

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