

# Seizing the opportunity on AIDS and health systems

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**With contributions from**

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A comparison of donor interactions with national health systems in Mozambique, Uganda, and Zambia, focusing on the U.S. President's Emergency Plan for AIDS Relief, the Global Fund to Fight AIDS, Tuberculosis and Malaria, and the World Bank's Africa Multi-Country AIDS Program



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ISBN 978-1-933286-33-4

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Support for the HIV/AIDS Monitor is generously provided by the Bill & Melinda Gates Foundation, the International Development Research Centre of Canada, the William and Flora Hewlett Foundation, the David and Lucile Packard Foundation, and the Swedish International Development Cooperation Agency.

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Editing and typesetting by Communications Development Incorporated, Washington, D.C.

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# Summary

While a vigorous debate continues over whether donors should be devoting such large amounts of money to AIDS as they now are—compared with their spending on other global health priorities<sup>1</sup>—it is clear that the global response to HIV/AIDS constitutes a historic marshalling of resources for health. Never has so much international aid been dedicated to global health, let alone to a specific disease.<sup>2</sup>

Global AIDS donors, including three of the biggest—the U.S. President’s Emergency Plan for AIDS Relief (PEPFAR), the Global Fund to Fight AIDS, Tuberculosis and Malaria, and the World Bank’s Africa Multi-Country AIDS Program (the MAP)—are carrying out a large-scale experiment in global health aid. As that experiment unfolds, participants and observers debate a key question about health systems: is AIDS money strengthening health systems, making governments and the private sector better able to deliver a broad range of high-quality health services? Or is it weakening health systems by establishing heavily resourced systems focused on combating a single disease?

What seems certain is that the future of the global HIV/AIDS response cannot be considered independently from that of national health systems—defined here as “all actors and institutions in a country whose primary intent is to improve or maintain health in a given country.”<sup>3</sup> AIDS donors should be concerned about health systems because such systems in African countries, including Mozambique, Uganda, and Zambia, face major weaknesses, including a health worker shortage and a lack of adequate capacity and infrastructure to establish and

maintain supply chain and information systems. Such weaknesses are not new, but have hampered health services provision for decades.

Unfortunately, we cannot now be sure how the increase in resources for HIV/AIDS might or might not be affecting health system capacity. Little is known about how the donor-supported HIV/AIDS programs are now interacting with health systems and their various parts. And that lack of factual knowledge limits our ability to investigate cause and effect.

So, an immediately relevant question driving this report is: in what areas do the HIV/AIDS donor programs interact with key operational parts of health systems? To answer it, and to better inform the ongoing discussion of AIDS and health systems, the report investigates and compares the donors’ interactions in three countries (Mozambique, Uganda, and Zambia) with three components of health systems: the health information system, the supply chain system for essential medicines, and human resources for health.

The report focuses on these three parts of health systems—the health information system, the supply chain system for essential medicines, and human resources for health—because:

- In several African countries, where donors often support more than 90% of the national AIDS response,<sup>4</sup> the information all

1. See for example British Medical Journal 2007.

2. The AIDS response is multisectoral, but a large percentage of AIDS funding does flow into the health sector.

3. WHO 2000.

4. See Oomman and others 2007, p. 7.

stakeholders use to monitor the national response often comes from health information systems and other country information systems.

- Properly functioning supply chains are critical to ensure that health commodities—including essential medicines—reach the right places at the right times and in the right quantities. Because supply chains for antiretroviral drugs and for essential medicines rely on many of the same resources, such as physical infrastructure, information systems, and health sector staff, HIV/AIDS programs must take care to avoid using those resources in ways that harm a country's ability to simultaneously operate a well-functioning supply chain for essential medicines. In some situations where the processes and the technical knowledge needed in both supply chains are quite similar, integrating functions in both chains might make it possible to reduce costs and use resources more efficiently.
- The health worker crisis is arguably the greatest obstacle to improving people's health in Africa. Because AIDS programs are largely implemented through country health systems, the staff crisis is a major barrier to scaling up HIV/AIDS programs in many of the most severely affected countries.

For this study, research partners in Mozambique, Uganda, and Zambia collected information by reviewing policy and program documents and interviewing officials from the donor agencies, governments, and funding recipients, as well as other stakeholders. The three countries studied were selected because they vary in size, HIV prevalence, development indicators, stages of the epidemic, and the nature and strength of government responses and donor involvement. Although three countries is too small a sample to support broader inferences, looking at the donors' practices in countries that differ from one another in important ways can point to underlying patterns of donor behavior.<sup>5</sup>

5. Full details about study methods and limitations are in the annex.

The report finds that, at the operational level, all three donors have helped to establish AIDS-specific systems and processes distinct from those for other health programs. The donors have supported AIDS-specific reporting systems and antiretroviral-specific logistics systems, and they have trained and paid health workers to provide AIDS services. Such AIDS-specific processes for health information, supply chains, and human resources use many of the same resources as a country's broader health system. For example, they use the same infrastructure and health facility workers, who must often complete separate reports for AIDS donors and for the health information system. And antiretrovirals and essential medicines are stored at the same warehouses and often delivered on the same trucks to many of the same health facilities.

### **Health systems before the three donors and the development of national AIDS responses**

Before funding arrived from the three AIDS donors discussed in this report, the health systems of Mozambique, Uganda, and Zambia were characterized by significant weaknesses.<sup>6</sup> A lack of human resource capacity was a major constraint in all three countries. Other specific problems varied:

- Mozambique's health system suffered from weak government capacity and from disjointed planning processes, despite the establishment of a common fund to coordinate health sector donors.
- Uganda's health system had weaknesses including poor fiduciary management and procurement problems for drugs and other health goods.
- Zambia's health system was limited by resource constraints, including insufficient investment in service delivery.

The challenges persisted despite significant system-wide reforms in all three countries, such

6. See for example WHO and Mozambique Ministry of Health 2003 or Horizons International Ltd 2001; Business Synergies 2002; AMREF 2004; and Ssennono, Petit, and others 2005, as cited in Ssengooba and Ekirapa forthcoming b.



as the adoption of minimum health care packages and comprehensive sector-wide approaches to manage donor aid.

National AIDS responses in Mozambique, Uganda, and Zambia developed at different junctures and in different ways. In all three countries, however, the donors have played an important role, working with each government to establish and expand its national AIDS response. Donors, for example, have worked with governments to develop national strategic plans and have encouraged the development of national AIDS councils to coordinate the multi-sectoral response to the epidemic.

The three donors examined here began providing funding after 2000, and by 2004 all three donors were active in all three countries. As the funds began to flow, donors worked with each government to establish AIDS-specific systems for health information, supply chain management, and health worker training and pay.

**Health information systems: AIDS information flows are a priority for donors and for national governments, but are fragmented—and donor-funded programs are at once inside and outside existing systems**

Because of the need to report on results from HIV/AIDS programs, AIDS information flows in Mozambique, Uganda, and Zambia are a priority for AIDS donors and for national governments. Yet the AIDS information is dispersed through several channels. Data on each country's HIV/AIDS response from all sectors involved (education, transport, and others) are reported through national AIDS monitoring and evaluation systems, which the national AIDS councils manage. But health-related HIV/AIDS data—including program data, financial data, human resource information, logistics information, disease surveillance, and AIDS treatment information—are reported through health information systems, which national health ministries manage.

Each country's health ministry and national AIDS council share information to an extent that varies by country. In all three countries,

however, the sharing of information between health information systems and national AIDS monitoring and evaluation systems could be improved. For example, in Mozambique, the health ministry shares information it collects on the national AIDS response with the national AIDS council at semiannual review meetings—but it is unclear whether or, if so, how information regularly flows from the health ministry to the national AIDS council outside of those meetings.

In each of the three countries donors draw information from parts of the health information system and from national monitoring and evaluation systems. Meanwhile, all three donors have their own donor-specific reporting requirements in all three countries. The proliferation of information systems results partly from donors' own priorities and accountability requirements. But it also reflects weak government coordinating structures for health information system management. And it reflects the ill-equipped, underfinanced state of national AIDS councils. For example, a midterm review of Uganda's monitoring and evaluation framework identified weaknesses including inadequate capacity at the Uganda AIDS Commission and a multiplicity of reporting requirements that do not always meet the national program's needs.<sup>7</sup> Staff at health facilities in all three countries are needlessly burdened—even as they struggle to provide clinical care, they must record more and more data to meet the demands of multiple reporting systems. In Zambia, for example, the PEPFAR-supported Antiretroviral Therapy Information Systems for tracking antiretroviral treatment programs was designed to be integrated into the health ministry's management information system, but now functions as a separate stand-alone system.

The U.S. President's Emergency Plan for AIDS Relief, or PEPFAR, uses country health information systems and country AIDS monitoring and evaluation systems for some program indicators. But it has also created its own monitoring and evaluation systems to assess results,

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7. See Craig-Huber and Asingwire 2003, p. 28, as cited in Ssenooba and Ekirapa forthcoming b.

investing heavily in collecting program data from its nongovernmental recipients. Although PEPFAR relies on and contributes to national population-based data collection, its country teams have their own structures for data storage and quality control, and do not share information systematically with governments or other stakeholders. For example, in Uganda PEPFAR's information system is managed by a contracted agency, Monitoring and Evaluation of Emergency Plan Progress (MEEPP).<sup>8</sup> All PEPFAR recipients report to MEEPP, which uses a customizable data management tool—focused on the data needs of U.S. government agencies—to collect, store, aggregate, share, and report data to PEPFAR staff.

PEPFAR partly funds and participates in the Joint Annual Programme Reviews, which assess AIDS response progress in all three countries. PEPFAR also supports activities to strengthen health information systems: in particular, it funds designated monitoring and evaluation posts (central and provincial) for Mozambique's health ministry, trains monitoring and evaluation officers in Uganda, and invests in information technology in all three countries.

The Global Fund to Fight AIDS, Tuberculosis and Malaria supports the country plans of its recipients in Mozambique, Uganda, and Zambia to draw information from health information systems and national AIDS monitoring and evaluation systems. For example, during one funding round the Fund supported Zambia's requests for funds to strengthen health management information systems, and to also increase, at the community level, local monitoring and evaluation capacity to collect and report data to the national AIDS council. Nevertheless, the Fund also requires reporting some information in a standard Fund format, using that information to make performance assessments which inform its funding decisions (in keeping with its performance-based funding model). In Uganda, for example, although the Fund uses

data from the health management information system, it also has specific indicators (such as for tracking progress with orphans and vulnerable children) that can require collecting data differently.

Recipients reporting to the Fund collect their own financial data. For program data they use the health management information system, population-based surveys, and other sources. Most of the information collected by the Fund for its performance assessments is published on its website ([www.theglobalfund.org/en](http://www.theglobalfund.org/en)). The Fund encourages recipients to allocate up to 5% of their Fund money for health management information systems.

The World Bank's Africa Multi-Country AIDS Program, or the MAP, supports and draws from country health information systems and national AIDS monitoring and evaluation systems. But it also has specific indicators and reporting requirements, especially for financial data. In both respects, the MAP resembles the other two donors discussed in this report. For example, in Mozambique the MAP uses the same indicators as the national AIDS strategy but requires that they be reported to the national AIDS council separately. The MAP also requests information on activities implemented to achieve targets for each MAP project, adding to the health ministry's reporting burden at the central level (though not at other levels).

The World Bank focuses on ensuring financial accountability in grant and loan recipients. It provides some resources to strengthen information systems, including monitoring and evaluation training and information technology investments. The Bank does not release program data to the public because it regards such data as government property.

The donors should take some immediate steps to improve how they approach their information needs:

- PEPFAR should reduce the reporting burden for district facility health workers by integrating its data collection requirements with those of each government and sharing information systematically and regularly with governments and other country stakeholders.

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8. Further information on MEEPP is available online (<http://www.s-3.com/images/PDFs/meepp.pdf>), as is information about MEEPP's partner reporting system ([www.meepp.or.ug](http://www.meepp.or.ug)).

- The Global Fund should require that all primary recipients' proposals include clear objectives and indicators to strengthen monitoring and evaluation systems—with the objectives to be achieved by the third year of the grant (Phase 2).
- The MAP should ensure that basic supplies for data collection, such as registers, are sufficiently available and that monitoring and evaluation staff are trained to feed high-quality data rapidly into national health management information systems and other information systems.

Further recommendations, in the last section of this summary, will focus on how the donors should seize the present opportunity to strengthen health information systems even as they continue to gather information related to HIV/AIDS.

**Supply chains for drugs: antiretroviral systems are separate, but most closely interact with systems for essential medicines in storage, distribution, and logistics information management**

In all three countries, the Global Fund, PEPFAR, and the MAP have worked with governments to develop supply chains for antiretroviral drugs. The supply chains are still fairly small, however, often serving 300 facilities or fewer. They rely largely on public structures. Yet they generally function more smoothly than the much larger government-managed supply chains for other essential medicines.

The two supply chains for antiretrovirals and for essential medicines interact to varying degrees for different supply chain functions in the three countries. In the early functions (selection, quantification, and procurement), the two supply chains are largely separate. In the later functions (storage, distribution, and logistics management), they more clearly interact, and in some cases they are integrated. For example, antiretrovirals and essential medicines are stored and distributed mostly by each country's central medical stores. In Zambia the two types of drugs are even transported on the same trucks.

Although antiretroviral supply chain systems in Mozambique, Uganda, and Zambia are designed to mainly use public structures, the donors also have some of their own procedures for certain supply chain functions.

PEPFAR, for example, procures its own antiretrovirals, which it delivers to each country's central medical stores. Then they follow the distribution system used for most other antiretrovirals. PEPFAR also funds extragovernmental recipients that do their own procurement and, in some cases, their own forecasting or distribution (or both).

In contrast, Global Fund primary recipients can choose to do their own procurement. But if the recipients' procurement systems are not robust, the Fund often encourages outsourcing. Most Fund procurement is overseen by country governments (though in Zambia a nongovernmental recipient was funded to do its own procurement and distribution because of weaknesses in the public system). Global Fund money can be used to strengthen supply chain management at a primary recipient's request.

MAP procurement is carried out by each government following World Bank procedures and guidelines. Procurements more than a certain value must be approved by Bank staff on a "no objection" basis (they are approved if the Bank explicitly indicates that it does not object). In Zambia and Uganda procurement is carried out by a MAP-specific project management unit within the government. In Mozambique, however, procurement is integrated into the health ministry's standard system.

All three donors fund activities to strengthen the supply chain system for antiretrovirals. PEPFAR invests heavily in technical assistance to help governments better carry out some supply chain functions, such as forecasting and logistics information management. The Global Fund supports activities proposed by primary recipients. In Mozambique, Uganda, and Zambia recipients have used Fund money to hire additional procurement officers, acquire technical assistance, and expand warehouse capacity. And the MAP has helped expand warehouse capacity in Mozambique and Uganda, while in all three

countries it has invested in short-term training for supply chain staff.

The donors should take some immediate steps to improve their approach to supply chain management for antiretrovirals:

- All three donors should jointly establish systems to monitor and evaluate antiretroviral supply chains—and then share lessons widely to benefit other supply chains.
- PEPFAR should stop requiring the U.S. Food and Drug Administration’s approval for purchasing drugs, and should instead accept the quality standards of the World Health Organization’s prequalification project.
- The Global Fund should encourage primary recipients to address weaknesses in procurement and supply management assessment by the start of the third year of the grant (Phase 2).
- The MAP should increase efforts to carry out procurement through national health ministry procurement units.

Further recommendations, in the final section of this summary, will focus on how donors’ antiretroviral systems can make the most of the opportunity to strengthen countries’ essential medicine systems while ensuring effective antiretroviral delivery.

### **Human resources for health: AIDS donors focus on training existing health workers rather than hiring or training new ones**

Mozambique, Uganda, and Zambia—like most countries in sub-Saharan Africa—suffer from the unavailability and inequitable distribution of qualified health workers. The shortages affect all cadres of clinical workers, including doctors, nurses, managers, and administrative workers, with the most serious shortages in rural areas. More technical staff are needed to help manage programs. That includes monitoring and evaluation staff, procurement officers, and financial managers.

The three donors discussed in this report provide only limited support for training new health workers. Rather than supporting

preservice training for new health workers, they have mostly funded in-service health worker training focused on HIV/AIDS activities.

PEPFAR spends most of its training funds on existing health workers (though it makes limited investments to train new health workers in Mozambique and Zambia). PEPFAR has also provided salary top-ups to public clinical staff to compensate them for the extra work of administering PEPFAR-funded programs. Such top-ups, such as the extra \$9–11 paid to public health workers in Zambia to provide antiretroviral treatment, focus the attention of clinical staff on HIV/AIDS—in some cases reducing the time they give to other health services.

Although PEPFAR generally has not funded new public health worker hires, it has funded the hiring of a substantial number of nongovernmental health workers, many of whom earn much more than civil servants. For example, a clerk in a PEPFAR-funded program in Zambia makes about twice as much as a registered nurse in the public sector. In some cases, the larger salaries, with other benefits, have pulled staff away from general public health services into PEPFAR-funded HIV/AIDS programs.

The Global Fund supports training new health workers only in Mozambique, where it finances a health-sector common fund. But it funds short-term training for existing health workers in all three countries. Although the Fund has no explicit policy on hiring in the public sector, it has not supported hiring new public health workers in Mozambique, Uganda, or Zambia. Salary supplements, or top-ups, have been provided to public sector workers using Fund money in Mozambique and Uganda—a practice that can lead staff to focus on Fund activities at the expense of other health services. Whether Fund money is used to hire nongovernmental health workers depends on the country; it also depends on what countries include in their grant proposals. In each country recipients have made different decisions.

The MAP funds training new health workers only in Mozambique. But in all three countries it supports training for existing health workers. Training funded by the MAP usually focuses on HIV/AIDS services, though at

times it includes broader health issues. MAP money does not fund new public sector staff in Uganda, but in Mozambique and Zambia it has funded government initiatives to hire additional technical staff. The MAP does not fund salary top-ups except in Uganda (where it offers supplements to district officials for managing MAP programs). MAP money is not generally used to hire nongovernmental health workers.

### **Moving forward: an opportunity for the donors to strengthen health systems and expand AIDS programs**

The three donors now face a challenge. Given the emergency nature of the initial global response to AIDS, it is not surprising that donors chose to circumvent existing but weak components of national health systems to set up systems devoted to achieving immediate and demonstrable results for AIDS programs. But as the donors continue to increase AIDS funding and expand their programs, they will require greater shares of the resources in each country's health system. By using existing health systems to expand AIDS programs, without making a concerted effort to strengthen these already weak health systems, donors are likely to strain them.

Because stronger and robust health systems are essential to ensure a long-term, expanded AIDS response, the three donors should take decisive steps that can benefit both AIDS programs and larger country health systems. Certainly, global AIDS financing cannot be held solely responsible for fixing these systems. Many other stakeholders have important roles to play—especially the governments, which must lead by making strong commitments to improve health systems. But the donors can, and should, take advantage of opportunities to strengthen health systems while implementing and expanding their AIDS programs. In particular, we recommend that the donors take several actions.

#### **Recommended actions to improve health information systems:**

*Coordinate government and donor information needs and flows through national health*

*management information systems and other systems—to reduce information system fragmentation, to minimize duplicative and burdensome reporting, and to improve data quality.* Donor-specific reporting systems have added complexity to the information flows for AIDS and health in all three countries. In the short term, donors can help to manage the added complications by working with each government to collectively map all information needs—theirs and the government's—against country information system capacity. With such a map, the donors and the government could coordinate data collection to minimize duplication and enable the donors to provide support—finances, human resources, and information technology—as needed.

In the long term, the donors should work to eliminate their donor-specific AIDS systems, because such systems increase the burden of reporting for scarce health sector staff. But that cannot be done without first strengthening the health information systems in all three countries.

*With governments and other stakeholders, design and invest in information technology solutions for data capture, management, and analysis in health ministries, districts, and facilities.* Information technology investments by all three donors have not been widespread enough to reduce the fragmentation of AIDS information flows, nor have they been consistently provided in the three countries studied.

*Capture investments and their results in building information systems management capacity more systematically.* All three donors are providing specific inputs—finances, human resources, training—to increase the capacity of government and other stakeholders to manage health information systems. Yet no donor has captured those inputs systematically. More important, the three donors have not measured the results of their investments so that they can expand activities that are working well and adjust activities that are not having their intended effect.

*Create data collection and reporting incentives through information feedback systems.* By sharing the results—including program and financial measures—with health managers and workers, donors can make the information usable by those who collect it, leading them to value it more and driving them to collect higher-quality data. For example, monitoring data reported to MEEPP in Uganda could be shared with health managers at all levels—community, district, and province—to let them monitor their own progress on an ongoing basis, in addition to collecting and reporting data for monitoring the response at higher levels.

### Recommended actions to improve supply chain systems:

*Pursue strategies to let antiretroviral drugs and essential medicines be distributed jointly and managed using the same logistics management information system.*<sup>9</sup> In all three countries studied, once procurement is completed, essential medicines and antiretroviral drugs follow paths with clear similarities. Often they use the same resources, including storage space, distribution systems, staff time, and information systems.<sup>10</sup> Despite these similarities, the three global AIDS donors have decided for several reasons—including weaknesses in existing health drug distribution systems and the critical importance of avoiding antiretroviral stockouts—to support procedures for antiretrovirals that are separate from those for essential medicines. Although the approach has allowed quick and effective antiretroviral distribution, it places heavy demands on the resources that are used for both antiretrovirals and essential medicines.

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9. Merging supply chains does not necessarily imply that one system (such as that for antiretrovirals) begins to use the other system (such as that for essential medicines). It can also mean that a new system is established to accommodate several established systems (for antiretrovirals, for essential medicines, or for other goods). Supply chains can be integrated in various ways. Alternatives to full integration include integrating one or more specific functions, such as distribution or logistics information management.

10. Although procurement is also similar for both types of drugs, many different actors—including governments, donors, and procurement agents—are now engaged in procurement, and they tend to use different resources.

As antiretrovirals come to be offered at more and more facilities, maintaining the separate systems will become increasingly complex.

Through their support for antiretrovirals the donors and governments have demonstrated that—with strong commitment and sufficient financing—well functioning storage, distribution, and logistics management procedures can be established. There are also places where donors have merged aspects of the systems for antiretrovirals and essential medicines: in Mozambique, for example, the donors have partly integrated antiretroviral procedures into the broader systems for essential medicines. The donors should explore, country by country, the prospects for using common systems for storage, distribution, and logistics information management. Such common systems could be created by:

- Integrating one system into another (after making needed improvements to the system that will be retained).
- Establishing new systems that accommodate both antiretrovirals and essential medicines.
- Outsourcing storage, distribution, and logistics information management to the private sector.

### Recommended actions to strengthen human resources for health:

*Provide more support to train new health workers.* Training new health workers (preservice training) is an important way to address the human resource crisis in African health systems<sup>11</sup>—yet the donors have funded very little of it. Each donor should provide significant support to local education institutions to train more health staff, both clinical and technical, to support an expansion of HIV/AIDS programs while other health services are maintained or expanded.

*Give priority to financing new health worker hires—as opposed to providing top-ups for current health workers.* Top-ups for AIDS-related tasks compensate public health staff for the added work of implementing donor-funded

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11. See, for example, Huddart and Picazzo 2003.

HIV/AIDS programs. But top-ups also tend to focus an already overburdened workforce on AIDS services—at the expense of other important health programs.

A better way to address staff constraints for donor-funded AIDS programs is to finance new hires, in both the public and nongovernmental sectors, to absorb the added workload. Such hires would, of course, require a supply of qualified workers. And that underscores the need to train new health workers (as recommended above).

If top-ups must be used, donors should consider supplementing workers for all the hours they work—not just for the hours they spend on AIDS tasks. This would compensate staff for the increased workload while ensuring that they do not give HIV/AIDS services priority at the expense of other important health services.

*Work with governments to improve public-sector human resource policies.* Much of the human resource crisis in African health systems results from low salaries, poor incentives, and rigid human resource policies that fail to reward good job performance. Donors should work with governments on medium- to long-term strategies to increase health worker pay, to create incentives for better performance, and to make hiring, promotions, and salaries more flexible. That would encourage more qualified workers to enter and stay in the public health workforce while also motivating current health workers.

By shedding new light on the interactions between HIV/AIDS donor programs and key operational components of health systems, this report raises several questions while making possible a better informed inquiry about the possible effects of AIDS programs on health systems. For example, the report identifies ways that donor programs are fragmenting systems for supply chain management and information gathering. But is fragmentation good or bad? Does it lead to more focused systems, with clear lines of accountability and opportunities for cross-learning? Or does it create inefficiencies by duplicating efforts and making coordination more difficult?

As PEPFAR, the Global Fund, and the MAP work to extend the reach and effectiveness of their HIV/AIDS programs, they will continue to find that country health system weaknesses create barriers to program expansion. To surmount those barriers they should finance programs in ways that increase the abilities of country health systems to provide broad quality health services, while doing the least possible harm to those systems. But to create greater incentives for donors to seize this opportunity, actions by country governments are also urgently needed. Earmarked funding for HIV/AIDS is evidently here to stay. The approach recommended here will ensure that donor funds bring the greatest possible benefits to country health systems while also achieving desired AIDS-specific outcomes.

## About this report

While a vigorous debate continues over whether donors should be devoting such large amounts of money to AIDS as they now are—compared with their spending on other global health priorities<sup>12</sup>—it is clear that the global response to HIV/AIDS constitutes a historic marshalling of resources for health. Never has so much international aid been dedicated to global health, let alone to a specific disease.<sup>13</sup>

Global AIDS donors, including three of the biggest—the U.S. President’s Emergency Plan for AIDS Relief (PEPFAR), the Global Fund to Fight AIDS, Tuberculosis and Malaria, and the World Bank’s Africa Multi-Country AIDS Program (the MAP)—are carrying out a large-scale experiment in global health aid. As that experiment unfolds, participants and observers debate a key question about health systems: is AIDS money strengthening health systems, making governments and the private sector better able to deliver a broad range of high-quality health services? Or is it weakening health systems by establishing heavily resourced systems focused on combating a single disease?

What seems certain is that the future of the global HIV/AIDS response cannot be considered independently from that of national health systems—defined here as “all actors and institutions in a country whose primary intent is to improve or maintain health in a given country.”<sup>14</sup> AIDS donors should be concerned about health systems because such systems in African countries, including Mozambique, Uganda, and Zambia, face major weaknesses, including a health worker shortage and lack of adequate capacity and infrastructure to establish and main-

tain supply chain and information systems: such weaknesses are not new, but have hampered health services provision for decades.

Unfortunately, we cannot now be sure how the increase in resources for HIV/AIDS might or might not be affecting health system capacity. Little is known about how the donor-supported HIV/AIDS programs are now interacting with health systems and their various parts. And that lack of factual knowledge limits our ability to investigate cause and effect.

So, an immediately relevant question, and one that is driving this report, is: what areas do the HIV/AIDS donor programs interact with key operational parts of health systems? To answer it, and to better inform the ongoing discussion of AIDS and health systems, the report investigates and compares the donors’ interactions with three components of health systems in three countries (Mozambique, Uganda, and Zambia): the health information system, the supply chain system for essential medicines, and human resources for health.

The report focuses on these three parts of health systems—the health information system, the supply chain system for essential medicines, and human resources for health—because:

- In several African countries, where donors often support more than 90% of the national AIDS response,<sup>15</sup> the information

12. See for example British Medical Journal 334.

13. The AIDS response is multisectoral, but a large percentage of AIDS funding does flow into the health sector.

14. WHO 2000.

15. See Oomman and others 2007, p. 7.



all stakeholders use to monitor the national response often comes from health information systems and other country information systems.

- Properly functioning supply chains are critical to ensure that health commodities—including essential medicines—reach the right places at the right times and in the right quantities. Because supply chains for antiretroviral drugs and for essential medicines rely on many of the same resources, such as physical infrastructure, information systems, and health sector staff, HIV/AIDS programs must take care to avoid using those resources in ways that harm a country’s ability to simultaneously operate a well-functioning supply chain for essential medicines. In some situations where the processes and the technical knowledge needed in both supply chains are quite similar, integrating functions in both chains might make it possible to reduce costs and use resources more efficiently.
- The health worker crisis is arguably the greatest obstacle to improving people’s health in Africa. Because AIDS programs are largely implemented through country health systems,

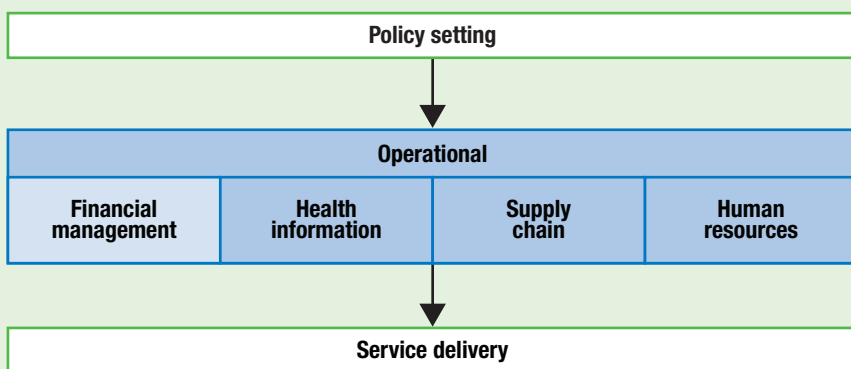
the staff crisis is a major barrier to scaling up HIV/AIDS programs in many of the most severely affected countries.

By looking at these three components the report focuses on the operational part of health systems—a space between policy setting and service delivery, linking donor inputs and service provision (figure 1). Although the operational level is poorly understood, it significantly influences the delivery of health services. (Further details about study methodology are in the annex.)

Chapter 1 sets the stage by surveying the evolution of national health systems and AIDS responses in Mozambique, Uganda, and Zambia both before and since the arrival of the three global AIDS donors in 2001–04. The next four chapters analyze how donors in the three countries have interacted with health information systems (chapter 2), drug supply chain systems (chapter 3), and human resources for health (chapter 4). The final chapter (chapter 5) recommends ways for the three AIDS donors—given their present interactions with country health systems—to seize the opportunity and expand their AIDS programs while improving country health systems.

Figure 1

**Three key components of a national health system: the health information system, the supply chain, human resources for health**



Note: Financial management is not discussed in this report. For a detailed analysis of donor financial flows in the three countries studied, see Oomman and others (2007).

Source: Authors' construction.



# 1

## Setting the stage: national health systems before the three donors and the development of national AIDS responses

To clarify how donors have affected national health systems it is important to describe certain aspects of those systems before 2001–04, when PEPFAR, the Global Fund, and the MAP arrived on the scene. (This report’s use of the term *national health system* is clarified in box 1.1. The lack of a consensus on this term’s definition makes it essential to break it down into smaller components for analysis.)

Before the arrival of funds from PEPFAR, the Global Fund, and the MAP, the health systems of Mozambique, Uganda, and Zambia contained significant challenges. Specific problems varied across countries, but a lack of human resource capacity was a major constraint in all three. The challenges persisted despite significant system-wide reforms in all three countries, such as the adoption of minimum health care packages and comprehensive sector-wide approaches to manage donor aid.

National AIDS responses in the three countries studied have developed at different times and in different ways—but in each country the donors have played an important role, working with the government to initiate and expand the national response. In each country, for example, donor representatives serve alongside other stakeholders on technical working groups convened by the government to oversee the response. Donors have worked with all three governments to develop national strategic

### Box 1.1

#### What is a national health system?

The World Health Organization defines a *national health system* as “all actors and institutions in a country whose primary intent is to improve or maintain health in that country.”<sup>1</sup> A national health system can include health ministries, other government entities, nongovernmental organizations, faith- and church-based organizations, and private for-profit firms providing health goods or services. In addition, a national health system comprises several subsystems, including a financial system, a health information system, a supply chain system, and a human resource system.

Although a government may be the steward, overseer, or coordinator of the national health system, it is not the only actor. In the literature on global health the terms *national* and *country* (which are sometimes used ambiguously to describe systems, such as national monitoring and evaluation systems, or plans, such as national AIDS plans) might easily be mistaken to denote government systems or plans. When this report mentions a *national system* or a *national plan* it does not refer to government systems or plans but to various stakeholders from the government, the nonprofit and for-profit sectors, the faith-based community, the international donor community, and others.

The key difference between a national health system and a government health system is that a national system includes meaningful participation by nongovernmental actors.

#### Note

1. WHO 2000.

plans and have encouraged the establishment of national AIDS councils to coordinate the several sectors involved. Given this close working relationship, it can often be quite difficult to distinguish a government's actions from those of the donors.

In 2000 the three donors began scaling up their funding, and by 2004 all three were active in all three countries studied (figure 1.1). Among the many results of the increased funding, one was a joint effort by donors and the government in each country to offer free antiretroviral treatment through the public system.

The following sections examine each country's national health system before the arrival of the three donors; they also offer brief accounts of how each country's AIDS response has since evolved.

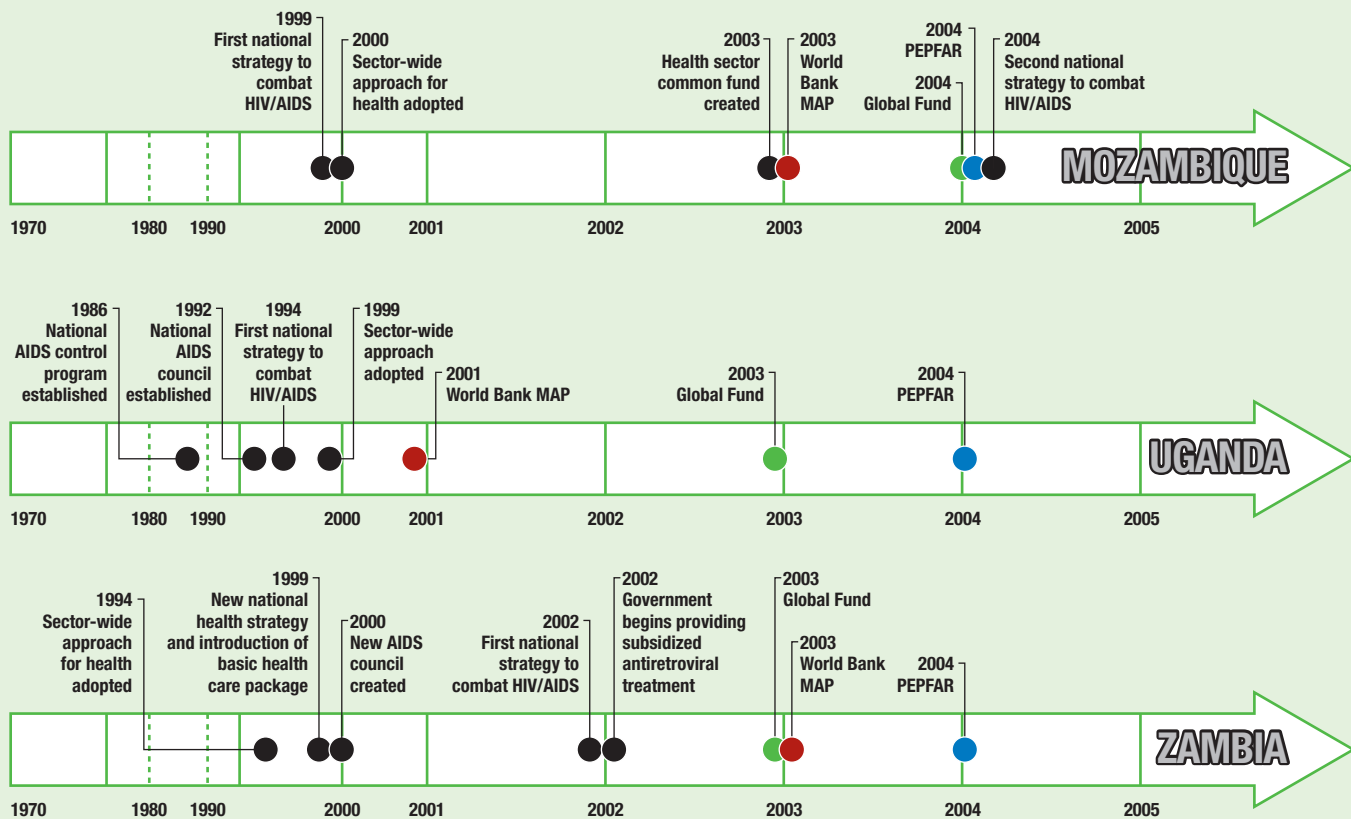
### Mozambique: toward pooled funding despite weak government capacity

*The government was the major health services provider in Mozambique before the arrival of the three donors. More than 90% of the formal health care supply came from the public sector.<sup>16</sup> Mozambique's health system included health posts and basic centers, rural district hospitals, provincial hospitals, and central hospitals.*

*The major development before the arrival of the three donors was the establishment of a sector-wide approach for the health sector, with a general common fund replacing the common fund for recurrent costs. Even before the entry of the three donors the majority of health funding came*

16. Mozambique Country Coordinating Mechanism 2006.

Figure 1.1 Start of HIV/AIDS donor programs in Mozambique, Uganda, and Zambia in the context of health sector reform and AIDS response developments



Source: Authors' construction.

from external donors. Much of that money was being spent on HIV/AIDS.<sup>17</sup>

In 2000 Mozambique and its development partners decided to establish a sector-wide approach to health. The decision reflected a consensus among the donors on how best to coordinate health sector aid to what had become a “donor darling” country, as well as the eagerness of Mozambique’s health ministry to capitalize on the donors’ commitment to better coordination.

The sector-wide approach included features to help the health ministry and its development partners work together, including:

- A health sector strategic plan.
- A code of conduct.
- A coordination committee.
- Sector-wide approach working groups.
- A set of review mechanisms.

The sector-wide approach also included a common funding pool, created in the spring of 2003, which became the tool for governments to coordinate donor aid flows. Some of the funding for the national AIDS response, including money from the Global Fund, was provided through the common health fund. A provincial common fund and common fund for drugs were also established.

With these structures in place Mozambique’s sector-wide approach quickly became known in global health circles as a promising model for increased government leadership and better donor coordination.<sup>18</sup>

*Mozambique’s health system suffered from several systemic weaknesses, including weak government capacity in critical areas, disjointed planning, and staff constraints.* Poor financial management yielded poor disbursement and expenditure rates. Since 1999 several joint health ministry and World Health Organization evaluations have exposed serious flaws in the Mozambique government’s health infor-

mation system—for example, “incomplete and inconsistent information” in finances, drugs, and human resources.<sup>19</sup> Health sector planning processes were disjointed, particularly between national and subnational actors. Provincial and district health plans often bore little relation to the national plan, and the idea of a sector-wide approach for health planning did not reach the subnational level.

Finally, Mozambique faced a health worker shortage and an inequitable distribution of workers across regions; rural areas faced much greater shortages than urban centers. Exacerbating the staff crisis was an inefficient system that did not permit movement through pay grades, limiting career advancement incentives.

*The design of the AIDS response in Mozambique has been influenced heavily by donors, particularly the World Bank.* Responding to a growing perception among donors that HIV/AIDS was now a development issue, Mozambique formally launched its national AIDS response in 1999 with the first National Strategy to Combat HIV/AIDS. That plan was heavily influenced by the Ideal Strategic Plan put forth by the World Bank. It followed the advice of the Bank and the Joint United Nations Programme on HIV/AIDS (UNAIDS) to expand the AIDS response beyond the health ministry to other sectors and nongovernmental organizations and to create a national body to coordinate the multisectoral response. The plan did not include antiretroviral treatment provision because resources were too limited to meet the drugs’ high costs.

In accordance with the first national strategic plan, a national AIDS council, O Conselho Nacional de Combate Ao HIV/SIDA (CNCS), was created in May 2000. A CNCS common fund was introduced to coordinate funding flows for the AIDS response. Money from the Global Fund would later be disbursed through the common fund; the MAP also recently started contributing to it.

In 2004 CNCS worked closely with donors to prepare a second national strategic plan for

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17. In 2002 external funds made up 57% of the government health budget; government HIV/AIDS expenditures were 65% of funding for disease programs. See Costa and Antunes forthcoming.

18. Martinez 2006.

19. WHO and Mozambique Ministry of Health 2003.

HIV/AIDS, one that would complement the national health sector strategic plan. By then new sources of HIV/AIDS funding, including the Global Fund and the MAP, had emerged. The donors ensured that the new HIV/AIDS plan included new strategies, most notably the expansion of antiretroviral treatment.

**Uganda: coordination was improving before the three donors arrived—despite weak systems for financial management, procurement, and human resources**

*Government and private for-profit entities were the main health providers before the three donors arrived. HIV/AIDS services were mainly provided by the government, faith-based organizations, and local nongovernmental organizations such as The AIDS Support Organization and the AIDS Information Centre.*

*After years of uncoordinated donor programs, in 1999 Uganda began moving toward greater coordination through sector-wide planning. Before 1999 Uganda's health system included many donor projects, with little government coordination. National health policies were not well developed. Procurement and information systems were tailor-made for individual projects. And accountability for results was predominantly to donor agencies—not the government.*

In 1999 Uganda developed a national health policy and adopted a sector-wide approach to coordinate key health stakeholders, including donors. A memorandum of understanding between donors and Uganda's health ministry provided that donors support the government's strategic plan—including a defined minimum health package—and work with and strengthen government systems.

A health policy and advisory committee, technical working groups, and joint review meetings were organized to increase coordination. One way for donors to support the sector-wide approach was through a newly created Partnership Fund. Donors, such as the U.S. Agency for International Development, began

working to establish more integrated and holistic programming, including the Uganda Program for Human and Holistic Development (UPHOLD) and the Uganda Integrated Model District Programme.

*Before the three donors arrived, major health system weaknesses in Uganda included poor fiduciary management, procurement problems for drugs and other health goods, and a severe shortage of qualified health workers.<sup>20</sup> Efforts were made by the government to strengthen financial management, increase the drug budget, make procurement more responsive to health facility needs, and train nurse assistants. Still, the systemic problems remained serious when the three HIV/AIDS donors started funding programs in Uganda.*

*Uganda developed an early national AIDS response focused on prevention. One of the first African countries to respond to the AIDS epidemic, Uganda established a national AIDS control program within its health ministry in 1986, to raise awareness of the epidemic and to step up programs for behavior change.*

In recognition of the need to move toward a multisectoral approach, a national HIV/AIDS policy and the Uganda AIDS Commission were created in 1992 to coordinate the national response. The response remained limited to prevention and mitigation. The first National Strategic Framework in 1994 provided broad guidance for implementing interventions.

*The donors helped fund the response to AIDS in the 1990s; since 2000 they have significantly increased their support. External funding for HIV/AIDS began flowing from the donors at the end of the 1980s. It is estimated to have supported 70% of Uganda's AIDS response between 1989 and 1998.<sup>21</sup> Much of that support came in the form of project-based aid to communities and subnational governments*

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20. Horizons International Ltd 2001; Business Synergies 2002; AMREF 2004; and Ssenono, Petit, and others 2005, as cited in Ssenooba and Ekirapa forthcoming b.

21. Hogle 2002.

for information campaigns, behavior change activities, voluntary counseling and testing, and condom distribution. By the end of the 1990s, projects often focused on capacity building, and a number of donors (particularly European donors) turned to budget support.

Little attention was paid to antiretroviral treatment before the arrival of money from the Global Fund and from PEPFAR in 2003 and 2004. Over 2003–06 funding for HIV/AIDS tripled, with PEPFAR providing the largest share.<sup>22</sup>

### **Zambia: reforming the health system for better coordination while dealing with resource constraints**

*The main service providers before the three donors arrived were the public sector and faith-based organizations.* The Churches Health Association of Zambia, the largest faith-based provider, offered roughly 30% of the country's health care.<sup>23</sup>

*Since 1991 Zambia has made a series of health sector reforms, including a basic health care package and a sector-wide approach supported by basket funding.* In consultation with external partners, the Zambian health ministry developed a sector-wide approach to coordinate health aid flows in support of the government's national health strategic plan in 1994. The country made some progress building viable management systems. In the late 1990s, however, it was recognized that the reforms had focused too much on systems development and too little on service delivery.

In 1999 the ministry and external funders signed a new memorandum of understanding to support an updated national health strategy. A basic health care package was intended to equalize access to basic health services. But the introduction of expensive treatments for high-priority diseases (malaria and HIV/AIDS) created questions about the definition of this basic package, since the government could not

finance the new treatments through its sector-wide approach. The package has never been fully defined or consistent over time.

*Before the three donors arrived, health system weaknesses in Zambia included a staff crisis, funding constraints, and inadequate investments in service delivery.* Structures, systems, and processes for health all improved during Zambia's period of reform. Yet the inadequacy of investments in service delivery made health outputs lag behind. A scarcity of funds for health—and a generally bad economy—also constrained services. These factors exacerbated Zambia's severe shortage of qualified health workers.

*Zambia's national AIDS response made an early commitment to treatment.* Zambia responded to HIV/AIDS fairly early—largely due to the loss suffered by President Kenneth Kaunda in 1986, when his son died from AIDS. Yet the response was not formalized until a national AIDS council was created in 2000 and made legal by Parliament in 2002.

The council prepared a national strategic plan for 2002–05. Its ability to coordinate the national response, however, remained weak. For example, not until December 2004—three years into the plan's implementation—was a monitoring and evaluation framework developed for the plan.

Before donor support arrived Zambia's government began a campaign to provide AIDS treatment: in 2002 it created a subsidized fee-for-service scheme with the goal of offering antiretroviral treatment to 10,000 patients. And after large amounts of donor funding began to flow, the country aggressively scaled up treatment. In 2005 it made antiretroviral treatment free.

*Nongovernmental organizations and faith-based groups have played an important role in the response.* The Zambia National AIDS Network, the Churches Health Association of Zambia, and other civil society groups have been vital to providing HIV/AIDS services—both before and after Zambia's national response was formally launched.

22. Oomman and others 2007.

23. Banda and others 2007.

# 2 Health information systems

Since 2000, when AIDS donors and others began pouring funds into countries affected by HIV/AIDS, the demand for information on this spending has grown more rapidly than that for other health information. Yet many countries—including those heavily affected by HIV/AIDS—face challenges in health information systems management and cannot afford to strengthen their systems on their own. (See box 2.1 for a definition of a *health information system*.)

Accordingly, all three donors discussed in this report fund activities to strengthen national HIV/AIDS information systems. It is possible, however, that such funding comes at the cost of privileging HIV/AIDS over other health priorities. And because none of the three donors has yet invested in systematically evaluating its efforts to strengthen health information systems, it is difficult to say just what these efforts have accomplished.<sup>24</sup>

AIDS donors have reason to be concerned about country health information systems and to promote their improvement. In sub-Saharan and Southern African countries—where donors often support more than 90% of the national AIDS response<sup>25</sup>—the information that government stakeholders, civil society stakeholders, and others use to monitor the national response comes from health information systems and other country information systems. Donors thus have a strong interest in strengthening the systems that yield the data on which they base their assessments of program effectiveness. (For a summary of donor interactions with country health information systems, see table 4.1 near the end of this chapter.)

24. According to personal communication with staff at the Office of the U.S. Global AIDS Coordinator, PEPFAR started evaluating health information systems in fiscal 2008. No results have yet been reported.

25. See Oomman and others 2007, p. 7.

When donors invest in systems that provide information largely for assessments of their own donor-specific programs, they are not necessarily building a country's capacity to monitor and evaluate its national AIDS response. Although all three donors discussed in this report generally use country health information systems to collect data, all three also impose additional information requirements that must be met outside those systems. Thus PEPFAR uses country systems for population data and some program indicators, but in Uganda and Zambia—where it is trying to strengthen country information systems by contributing information technology and by offering incentives to health workers—PEPFAR has also created its own HIV/AIDS monitoring and evaluation system for its own reporting purposes. The Global Fund uses country systems to access information and may provide particular monitoring and evaluation inputs based on what a country requests in its proposal—but the Fund's operating requirements also leave specific program and financial information to be collected in its own reporting format. And the World Bank, which uses country systems and supports increased monitoring and evaluation capacity for national health ministries (with technology and staff training, for example), also maintains its own specific indicator and reporting requirements for program and financial data.



## AIDS information flows in Mozambique, Uganda, and Zambia: a priority for donors and country governments, but fragmented

*Each of the three countries studied has a national monitoring and evaluation framework describing how information for HIV/AIDS programs should be captured.* The frameworks reveal that HIV/AIDS information, though a priority for donors and host country governments, is fragmented through different channels—and that the programs providing the data only rarely get a chance to benefit from feedback. Some data flow through the health information systems that are overseen by country health ministries. Other data flow directly to the national AIDS councils from various sources: for example, from surveys (the Demographic and Health Surveys, the Living Conditions and Monitoring Survey), from nongovernmental organizations, and from private for-profit health facilities. In addition, HIV/AIDS data unrelated to health come from

other sources such as transport ministries and education ministries. Information exchanges between the systems—particularly between those overseen by health ministries and by national AIDS councils—are inconsistent, with processes that differ from country to country.

### Uganda

In Uganda the national AIDS commission developed a comprehensive plan for monitoring and evaluation to be coordinated by the commission. But the data collected under that plan come from a variety of sources, including antenatal surveillance, HIV/AIDS behavioral surveys, the health management information system, and information collected individually by recipient organizations (organizations that receive money from the government or donors to implement programs). Although recipient organizations are supposed to report to the AIDS commission, not all of them do.

Some of Uganda's national monitoring and evaluation data come from the health ministry's

#### Box 2.1 What is a health information system?

A health information system provides reliable, timely health information for planners and decisionmakers to estimate resource inputs, identify implementation challenges, track progress, and evaluate the impact of health programs. Many health information systems are weak or function poorly because of insufficient investments in systems for data collection, analysis, dissemination, and use.<sup>1</sup> Such constraints make evidence-based health policy decisions, program design, and resource allocation an uphill battle.

Country health information systems include both population-based data sources and data sources related to health facilities. The main population-based sources for health information are:

- Censuses.
- Household surveys.
- Vital registration systems.

The main health information sources related to health facilities are:

- Public health surveillance.
- Health services data—sometimes called the *health management information system* or the *routine health information system*.
- Health system monitoring data (such as data on health infrastructure, health system financing, and human resources for health).

National health accounts also offer a comprehensive picture of health financing.<sup>2</sup>

#### Notes

1. For more on country health information systems see the Health Metrics Network website (<http://www.who.int/healthmetrics/support/en/>), including assessments of health information systems in Uganda and Zambia.
2. World Health Organization website for health information systems (<http://www.who.int/healthinfo/systems/en/>).

information systems, including the health management information system. For example, client registers, which capture data at the service provision level, have been expanded to include preventing mother-to-child transmission, antiretroviral treatment, and voluntary counseling and testing. Sentinel surveys track data on, for example, antenatal HIV/AIDS prevalence. Ministry-funded annual behavior surveys monitor trends in HIV/AIDS knowledge, condom use, age at first sex, multiple sexual partners, and sexually transmitted disease prevalence.

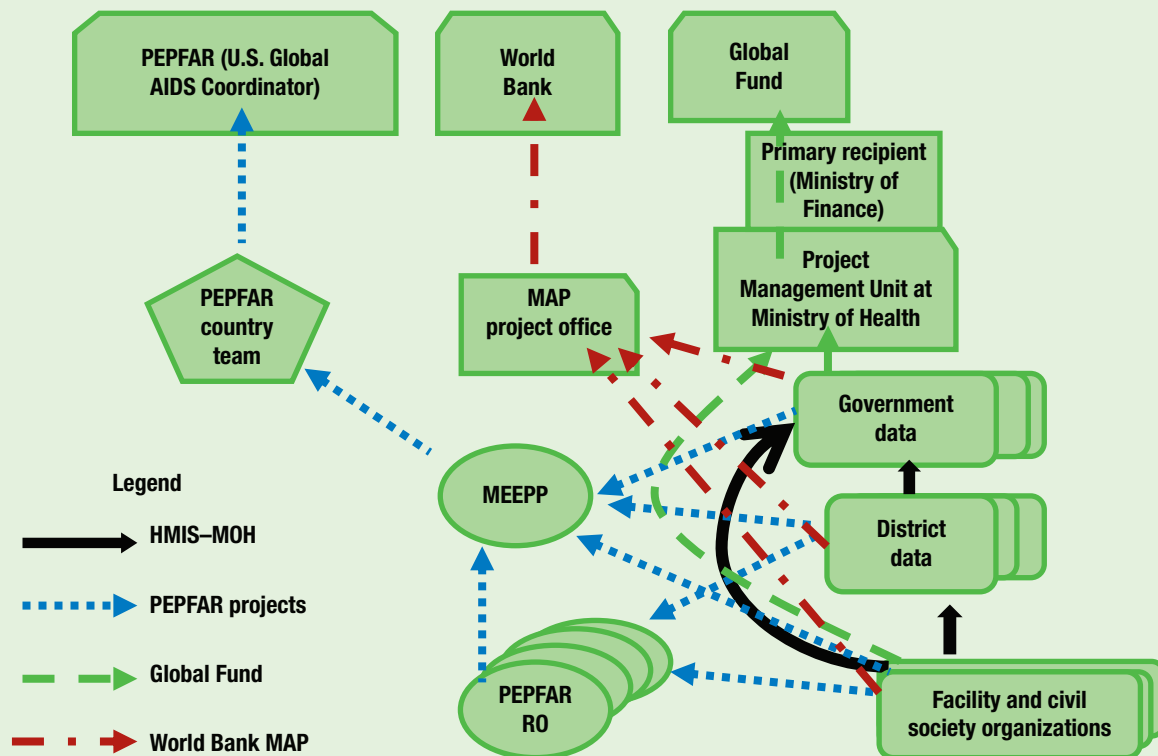
Uganda's health information system also captures data on all diseases, including HIV/AIDS. But its data are not considered highly reliable. A major problem is the system's heavy reliance on district structures—which are often slow and inefficient—to capture data. Other problems include the lack of appropriately updated

forms after new programs have been added and the lack of reporting from private, for-profit care providers.

In addition to using data from the health information system, the three donors all send special data reporting templates to their recipient organizations. For example, PEPFAR has funded a specialized supervision agency, Monitoring and Evaluation of Emergency Plan Progress (MEEPP), to support all PEPFAR programs. The donor-specific reporting requirements have made information flows even more complex. Many organizations that implement programs must report to several different places, often with overlapping information (figure 2.1) and usually without receiving feedback.

The Uganda AIDS commission's monitoring and evaluation plan includes no system that would pool all data routinely to monitor

Figure 2.1 AIDS donor reporting pathways in Uganda



Note: MEEPP is Monitoring and Evaluation of Emergency Plan Progress. RO is recipient organization. HMIS-MOH is the health management information system overseen by the Ministry of Health. Multiple boxes for some sources of information indicate multiple entities from which data flows upwards. Under a new institutional arrangement put in place after the 2005 suspension of Global Fund grants to Uganda, the Project Management Unit has been disbanded. After being managed since the end of 2005 by a caretaker firm, Uganda's HIV/AIDS grants will now be managed by the Uganda AIDS Commission.

Source: Ssengooba and Ekirapa Kiracho forthcoming a.

implementation of the national HIV/AIDS plan. Data comes in regularly from many sources, including annual performance reports submitted by donors. But the AIDS commission has limited capacity to process that information into national progress indicators—nor can it act on the information, because it lacks financial and human resources to support programs' corrective decisions.

### Mozambique

In Mozambique the overall responsibility for monitoring the national HIV/AIDS strategy lies with the national AIDS council, CNCS, which coordinates the country's multisectoral response. But the health ministry is responsible for providing information on 10 of the 27 indicators that are part of the national monitoring and evaluation strategy. The health ministry shares information with CNCS at semiannual review meetings for the national AIDS response, but it is unclear how information flows from the health ministry to the CNCS outside of these meetings.

The health ministry has faced challenges integrating its AIDS data collection with other health data. Until 2005/06 the health ministry had two monitoring systems, one for health and

another for HIV/AIDS. The ministry is trying to integrate the two systems, but the information collected is still not satisfactory because not all nongovernmental organizations working on HIV/AIDS-related activities are reporting through the integrated system.

### Zambia

In Zambia, when the national AIDS council's monitoring and evaluation system needs health information on HIV/AIDS, it draws on the health ministry's information management system. But because the health ministry's system is limited to the public sector, the council's monitoring and evaluation system must also draw on other sources, such as the private sector and global donor programs. In addition, the health ministry's system and its subsystems have weaknesses; their data may not meet all the requirements of the council's monitoring and evaluation system. So, the council also relies on data collected directly at the source, through surveys such as the Zambia Demographic and Health Surveys, Sexual Behavioural Surveys, and the Zambia Health Facility Survey. The full complexity of these information flows appears in figure 2.2.

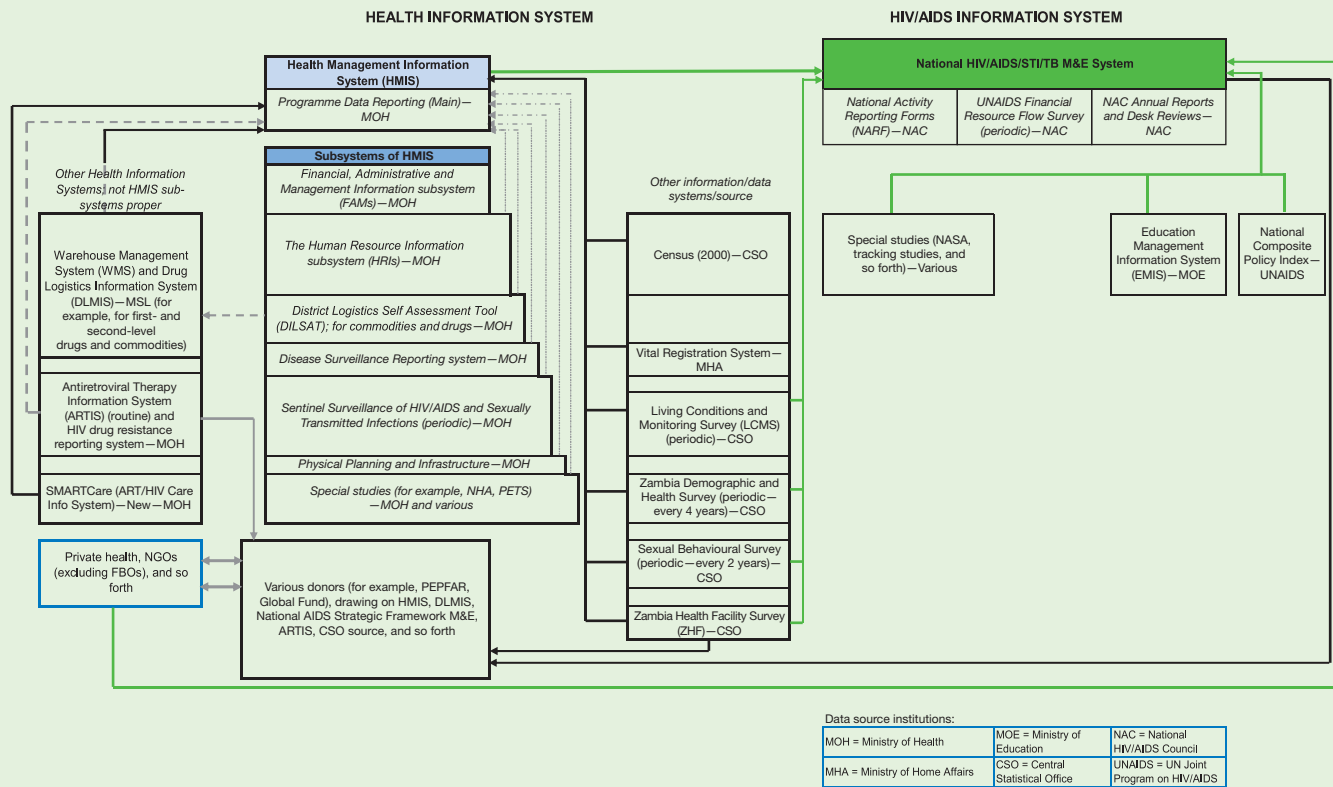
The Zambian health ministry's information system relies partly on data that other institutions have collected and that are often out of date or otherwise unreliable. Data collected by Zambia's central statistical office and by its home affairs ministry are poorly integrated with health ministry data. Data from the central statistical office—including health and other survey statistics—are expensive to collect and are generally periodic, being collected every two, four, or ten years, with extrapolations in the interim; any collection or computational errors are carried into the health ministry's system. And vital registration data from the home affairs ministry are almost nonexistent.

*Information systems in all three countries studied are fragmented by weak government coordination, ill-equipped and underfinanced national AIDS councils, and multiple donor systems with little coordination or information sharing. Although Mozambique's national AIDS council, CNCS, has structured monitoring and*

“Prior to the [nongovernmental organizations] sending their information to [the Department for Health Information], their reports were sent to the HIV/AIDS program at the [health ministry] headquarters with no link with the [health information system]. Efforts began being made in 2003/4 to better link the information from the provincial directorates to the [health information system], but this process is still with poor results. Since 2007 the [health ministry] has been implementing a new approach to the nongovernmental organization reporting process. In order to allow the integration of the [nongovernmental organization] information within [the health information system], they started to send information directly to the information department, with copies to the HIV/AIDS program.”

—Health ministry key informant, Mozambique

Figure 2.2 Information systems for health and HIV/AIDS in Zambia



Note: NGO is nongovernmental organization. FBO is faith-based organization. NHA is national health account. PETS is Public Expenditure Tracking Surveys. M&E is monitoring and evaluation.

The national HIV/AIDS monitoring and evaluation system, represented by the green boxes, is distinct from the health information system represented by the boxes with other colors. The HIV/AIDS monitoring and evaluation system includes inputs (not shown) from other sectors such as transport and education.

Source: Cheelo and others forthcoming.

evaluation since 2005, implementation is still at a formative stage. Although the data collection framework is well developed, there is no consistent followup on interventions.

A midterm review of Uganda’s monitoring and evaluation framework described the situation in 2003:<sup>26</sup>

Some of the constraints to the full achievement of monitoring and evaluation in the Uganda national response to the HIV/AIDS epidemic that were identified are: inadequate capacity at [the Uganda AIDS Commission]; the few agencies that have monitoring and evaluation systems are using them to

meet their own needs rather than to support needs of the national program; there is lack of harmonization of definitions and reporting procedures; and districts are requested to fill many different [monitoring and evaluation] forms for various agencies yet they receive limited feedback about their performance.

Uganda’s new national strategic plan for 2007/08–2011/12 provides for a performance monitoring and management plan to provide structure and coordinate routine information flows from various levels and stakeholders.<sup>27</sup>

26. See Craig-Huber and Asingwire 2003, p. 28, as cited in Ssengooba and Ekirapa forthcoming b.

27. Uganda AIDS Commission 2007, National Strategic Plan 2007/8–2011/12 (Draft 2), as cited in Ssengooba and Ekirapa forthcoming b.

*In all three countries studied the biggest challenge to facility monitoring is the increasing workload for health staff, as multiple donors establish additional HIV/AIDS information requirements and compete to record ever more data on treatment and clinical care.* In Uganda reports from service delivery points show that multiple tools are overburdening an already stretched workforce.<sup>28</sup> Donor collaboration has aimed at harmonizing data tools for use at facilities and designing new forms for use in the health management information systems. Even so, reports suggest that the donors have been competing with each other to get results attributed to their own funds, creating a burden on health workers. In the words of one technical staffer at Uganda's health ministry:

There was too much competition, too much urging over the numbers [on antiretroviral treatment]. This created a huge problem. Too much double counting. There were few sites with [antiretroviral treatment] and all the donors were clustering around these sites, all counting the same patients because they give some support here and there. They would then bring their reports to us [the health ministry] to receive a stamp of approval. The numbers from all these [donor] reports were not adding up. For example a PEPFAR funded provider was reporting that they have over 35,000 [antiretroviral] clients—this was found not to be the case. The [PEPFAR recipient] was including all clients that have ever been recruited including those that have died or those referred to other sites. So, double counting was a problem. So, we opted to use site [delivery point] reports and not the donor reports to monitor the programs. Donors did not like this move and many still resist this. They do not want us to get direct reports from their service delivery points.

Donor coordination is improving for data reconciliation meetings to minimize double

counting—but that is at the global level. Whether such meetings lighten the burden of reporting in countries, and at the health worker level, is not clear.

In Zambia the challenges of managing multiple systems seem to be increasing. With PEPFAR support the government has introduced the Antiretroviral Therapy Information Systems (ARTIS) and SMARTCare (see figure 2.2).<sup>29</sup> ARTIS collects all antiretroviral data, including for program evaluation. Originally intended to be integrated into the health ministry's management information system, ARTIS currently functions as a separate, stand-alone system. Another additional system formulated by Zambia's health ministry and funded by PEPFAR, SMARTCare puts personal information on a secure electronic card—effectively the patient's copy of his or her health facility record—which the patient presents to the clinician each time care is sought. In December 2007, SMARTCare was running at 135 centers, with about 130,000 records automated. Yet it is predominantly an HIV care information system; the only services automated under SMARTCare are for voluntary counseling and testing, antiretroviral therapy, antenatal care, and preventing mother-to-child transmission.

In Mozambique data collection is more integrated, even though separate donor-specific reporting systems exist. Mozambique's health ministry manages data gathering on HIV/AIDS and other health programs; its system generates data on most of the indicators, from facilities up to the health ministry. Global Fund and MAP recipients draw indicators from the national AIDS strategy, including information from the health information system. But they request additional information about activities to measure achievement against their specific performance targets. These integrated aid mechanisms may not create a work burden at service delivery points—but they do at the health ministry, especially for the ministry staff preparing the reports.

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29. SMARTCare was initially called Continuity of Clinical Care Patient Tracking System. For more information about SMARTCare, see <http://www.smartcareproject.org/>.

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28. As cited in Ssegooba and Ekirapa forthcoming b.

### Donor interactions with country health information systems: at once inside and outside

This section describes each donor’s interactions with specific parts of each country’s health information system, as it expands its program and monitors its contributions to the national AIDS response. At the end of the chapter table 2.1 summarizes the following types of interaction between donor HIV/AIDS programs and country health information systems:<sup>30</sup>

- Health information system resource inputs.
- Data management systems (including indicators, data sources, and data management).
- Information sharing.

30. WHO 2008b. Information on the different parts of the health information system and how they are related to each other can be found at the World Health Organization’s website ([http://www.who.int/healthmetrics/documents/hmn\\_framework200802.pdf](http://www.who.int/healthmetrics/documents/hmn_framework200802.pdf)).

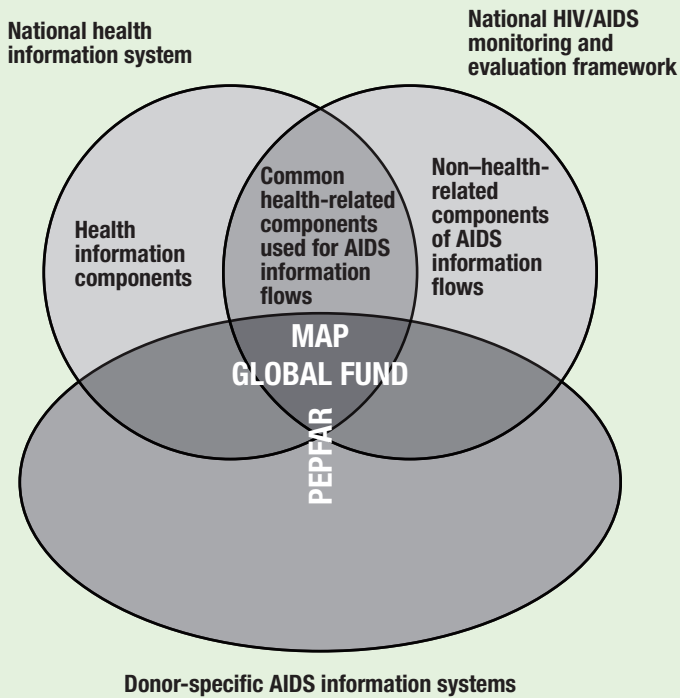
The donors interact with country health information systems in Mozambique, Uganda and Zambia to varying degrees, some directly and others indirectly. PEPFAR uses health information systems for some program indicators—but it has established its own monitoring and evaluation system in these countries for its own financial and program information needs, while it also contributes direct inputs to their health information systems. The Global Fund and the MAP use country health information systems for program data—but also have specific indicator and reporting requirements for program and financial data. (How the three donors interact with various components of country health information systems and national HIV/AIDS monitoring and evaluation systems—as well as how they rely on their own donor-specific systems for information—appears in figure 2.3.)

### PEPFAR: directly supporting and using national health information systems—while maintaining separate health information management systems

*PEPFAR directly supports human resource inputs for health information systems in the three countries studied.* In Mozambique that includes appointing (and supporting) or identifying a health ministry technical staff member to work solely on monitoring and evaluation. PEPFAR provides one technical adviser, who sits at the health information department (DIS), and is recruiting a second. PEPFAR has also placed monitoring and evaluation technical staff in the provinces. Finally, PEPFAR staff have participated in the past few annual joint AIDS program reviews (JAPR) of Mozambique’s national HIV/AIDS programs, which are conducted by the country’s health ministry and other development partners including the three donors.

In Uganda PEPFAR gives frontline service delivery workers financial incentives to improve data collection and to report on PEPFAR activities. In addition, PEPFAR country team members participate in the annual Uganda AIDS Commission meeting and in the National Partnership Forum, which reviews and

Figure 2.3 Donor interactions with health and HIV/AIDS information systems



Source: Authors’ construction.

monitors the progress of the HIV response among stakeholders.<sup>31</sup>

PEPFAR has also funded various technical assistance activities. Some of its recipients have received technical assistance—including computer software and hardware support—to improve data capture, processing, and transmission at Uganda’s health ministry and in some Uganda districts. PEPFAR has also helped to support—through funding and capacity building—several other surveys, including the national sero survey, the Demographic and Health Surveys, and district surveys on HIV/AIDS indicators that would use lot quality assessment surveys.<sup>32</sup>

In Zambia PEPFAR does not support monitoring and evaluation posts in the health ministry and does not directly support health worker posts in the provinces to help with data collection and reporting. PEPFAR-funded recipient organizations create posts for provincial referral officers who administer programs and help manage data collection.

PEPFAR participates in the Joint Annual Programme Reviews in Zambia in two ways. First, it contributes money to the national AIDS council, much of which supports each year’s review. Second, PEPFAR recipient organizations sit on the council’s technical working groups and go out with the council and other stakeholders to provide technical assistance for the reviews (these institutions are funded partly by PEPFAR).

PEPFAR recipient organizations in Zambia have also been developing SMARTCare. But, as described above, this system has not been well integrated into Zambia’s health management information system.

*PEPFAR uses information from national systems in all three countries studied.* Yet it also establishes its own collection structures for other data—the most extreme case being Uganda, where PEPFAR has a separate system outside the health management information system. PEPFAR’s data capture system in Uganda is

managed by a contracted agency, Monitoring and Evaluation of Emergency Plan Progress (MEEPP),<sup>33</sup> which oversees monitoring and evaluation by PEPFAR implementing partners. The agency triangulates and aggregates data and ensures coordination with the government. It also collects data from the health management information system resource center and aggregates it for monitoring and evaluation by PEPFAR. All PEPFAR recipients in Uganda are required to submit information on specific reporting indicators to Monitoring and Evaluation of Emergency Plan Progress, which uses a customizable data management tool focused on the data needs of U.S. government agencies to collect data, store it, aggregate it, share it, and report it to PEPFAR staff.

Monitoring and Evaluation of Emergency Plan Progress has created some monitoring and evaluation capacity in Uganda, through its establishment and through employing some local nationals—but that capacity is limited to PEPFAR country program targets and reporting requirements. Programs not supported by PEPFAR do not, as a rule, have any organized monitoring and evaluation system. To verify service data Monitoring and Evaluation of Emergency Plan Progress has worked closely with the Ugandan health ministry’s resource center, which is responsible for sector data from the health management information system.<sup>34</sup>

PEPFAR recipient organizations in Mozambique report using routine data from national health information systems for health facilities, districts, and provinces to report upstream to PEPFAR at the national level. PEPFAR uses these data for its own analysis and does not share its reports with Mozambique’s central health authorities, the health ministry, or the national HIV/AIDS council.

In Zambia PEPFAR also relies heavily on its own data collection and reporting. For program reporting in Zambia PEPFAR requires data that

31. USAID 2007.

32. Kintu and others 2006.

33. Further information on MEEPP is available online (<http://www.s-3.com/images/PDFs/meepp.pdf>), as is information about its partner reporting system ([www.meepp.or.ug](http://www.meepp.or.ug)).

34. Kifuko-Malinga 2003; UPHOLD 2005.

are not available through the health ministry's system, or that are available only for differently constructed indicators. For example, the health ministry's system typically aggregates data only by two age groups (under five years and five or more years), while many HIV/AIDS programs want to monitor other age groups (such as young adults and adolescents). So, PEPFAR recipients and subrecipients collect information directly from routine sources such as health facilities—and compensates health workers for the extra workload that such AIDS donor-specific data collection imposes on health workers. The result: health workers turn their attention toward HIV/AIDS and away from other health services.

*PEPFAR's approach to improving data quality differs in each country studied.* In Mozambique, where many PEPFAR recipients already have good quality assurance systems in place, PEPFAR has not made data quality and independence a formal part of its own monitoring and evaluation system. In Uganda data collected through the health management information system continues to be unreliable because workers are overburdened, data forms are obsolete, and there are no registers or computerized systems to manage the data. PEPFAR has tried to improve the data on its Uganda programs by giving health workers incentives to collect information.

In Zambia PEPFAR has aimed to improve the quality of information for health and HIV/AIDS planning and management. For data on procurement PEPFAR has provided financial and technical support to strengthen the logistics management information system and the logistics management unit. In addition, it has given sizable funds to SMARTCare and the antiretroviral therapy information system

(ARTIS). Nevertheless, little evidence was reported from Zambia about quality assurance for PEPFAR program data.

*PEPFAR does not systematically share the information it collects with national government officials in any of the three countries studied.* But it works with all three governments on data collection and reporting. In Mozambique it uses the health information system for program implementation data, but does not share data collected and analyzed by PEPFAR with the national health ministry or with other donors and stakeholders. Efforts to harmonize PEPFAR information with national systems have increased slightly now that the health ministry contains a PEPFAR-funded monitoring and evaluation officer, and now that PEPFAR is represented in the national HIV/AIDS council's monitoring and evaluation group (as well as in other working groups for the health sector-wide approach).

In Uganda PEPFAR's independent monitoring and evaluation system, Monitoring and Evaluation of Emergency Plan Progress, is managed to meet its own information requirements for program and financial monitoring of the PEPFAR program in Uganda. No systematic information sharing occurs between PEPFAR's country team and the country's government, although PEPFAR often participates in health ministry and Uganda AIDS Commission monitoring and evaluation meetings. PEPFAR has proactively shared performance data on program outputs at the annual HIV/AIDS stakeholder meetings of the Uganda AIDS Commission (the partnership forum). And Monitoring and Evaluation of Emergency Plan Progress officials regularly meet with the AIDS Control Project, the health ministry's program to track the scaling up of interventions within its mandate. They do so mainly to assess direct donor attribution of results by accessing added information from the health information system.

In Zambia PEPFAR draws on the same information systems that the national systems use. Ministry of health and national AIDS council member interviews suggest that PEPFAR recipient organizations are not mandated to share their information with the health

“Yes! UPHOLD [the Uganda Program for Human and Holistic Development] get their data from here—AIM [the AIDS/HIV Integrated Model District Programme] were getting their data from here until their programme closed. [The] MAP at the time that they knew it was available, they were coming[;] and then another keen user is MEEPP [Monitoring and Evaluation of Emergency Plan Progress]; they come and request for data from here and take it for their use.”

—Health ministry official, Uganda



ministry—and that, even if they were, staff deficiencies at the health ministry’s information system would limit its ability to process the reports.

### **The Global Fund: responding to countries’ requests and using their health information systems—but requiring special reporting of existing information**

*The Global Fund encourages countries to determine what inputs are needed to improve health information systems, and then to request funding (5%) from the Fund to support those inputs.* To improve monitoring and evaluation of proposed programs, many countries are adding explicit objectives and budgets for monitoring and evaluation to their Global Fund grant applications. For example, Zambia’s proposal to the Global Fund for round 4 requests about \$13 million dollars specifically for HIV/AIDS monitoring and evaluation. To learn whether the planned activities have been put in place would require further research in Zambia. What is clear is that the Global Fund responded to specific monitoring and evaluation requests in the proposal. Those requests include:

- Strengthening the health management information system’s capacity to monitor clients on antiretroviral treatment as the program was scaled up in the public sector.
- Strengthening the role of communities in advocacy and support for antiretroviral treatment services.
- Strengthening the capacity of communities to collect and report information on community activities to the national AIDS council.
- Operations research to ensure that information is collected on antiretroviral adherence, emerging HIV drug resistance strains, the role of directly observed therapy for antiretroviral treatment, health outcomes, and quality of life for patients on antiretroviral treatment.

The Fund does not support monitoring and evaluation posts either in Zambia’s national AIDS council or in its health ministry’s

information system. Funds could be programmed for such posts, but the country would have to include a plan for them in its proposal.

*In all three countries informants see the Global Fund moving toward supporting national programs and systems—but it will take time to transition away from Fund-specific information requirements for assessing results and recipient performance.* In Mozambique the Fund—like other donors—has set up parallel structures to meet its requirements. Similarly, in Uganda the Fund uses the health management information system, but also has specific indicators that can require collecting data differently (for example, reporting for orphans and vulnerable children uses additional data on Fund-specific indicators). Programs under the Fund are implemented under existing health ministry information systems and other sectoral systems. Programs implemented under the health ministry have attempted to use the health management information system—but that system has difficulty generating complete, timely data on indicators.

The Global Fund has relied on its Local Fund Agents to oversee grant reporting and performance from primary recipients. Its structures have served important roles, but have also confused or complicated existing power structures and accountability relationships. In Uganda the Local Fund Agent was supposed to audit the finance ministry (which was the primary recipient) on financial performance and the health ministry on programmatic performance. Although competent in financial auditing, the agent was less well-equipped for programmatic oversight, lacking a track record auditing HIV service delivery. Asked by the Fund to audit government agencies and provide confidential reports on government performance to the Fund secretariat, the agent was in a vulnerable position; such a role was not sustainable. After Uganda’s grant was suspended, bad publicity for the agent affected trust and goodwill toward a private for-profit business with strong competitors in the market.<sup>35</sup>

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35. Ssenooba and Ekirapa forthcoming b.

In Zambia the Fund has established a Local Fund Agent for financial reporting and a Country Coordinating Mechanism with oversight from the Fund Portfolio Manager for program reporting. Both differ from all the formal systems that preceded the Fund's financing of the country's AIDS response. Because reporting formats in existing national systems (health management information systems; financial, administrative, and management systems; and so on) do not meet Fund requirements, the Fund has supported the new Antiretroviral Therapy Information System, which serves donors well but is not integrated with health management information systems and has little use for health ministry planning. Or the Fund hires consultants for evaluations, especially when the new systems do not meet expectations.

*Of the three donors, the Global Fund is best at sharing information that it collects and analyzes.* In all three countries studied the Fund's primary recipients and its Local Fund Agents use financial and program information to report performance to the Fund. The Fund posts much of the information on its website, so all stakeholders have easy access to it. Whether the Fund proactively shares information with governments is not clear.

### **The MAP: using the health information system for its specific reporting procedures—and requiring additional information**

*In all three countries studied the MAP provides capacity-building inputs, such as staff training, support for demographic and health surveys, and enhancing management information skills—but the inputs are not systematically described or measured.* In Uganda the MAP has built monitoring and evaluation capacity in church-based organizations and in district structures that collect and report on MAP-funded programs' HIV activities. MAP funds have been used to train staff, to support regular supervision, and to provide computers for data collection. For

example, one MAP-supported training helped staff learn how to use new health management information system forms. The MAP also introduced lot quality assessment surveys, an innovative way to measure coverage and the achievement of program targets by Ugandan districts.

The MAP-supported Zambia National Response to HIV/AIDS project (ZANARA) has provided significant funds to develop staff monitoring and evaluation capacity. In 2005, for instance, the project committed 33% (\$1.3 million) of the total resources used for supporting the national AIDS council to coordinating multisectoral interventions and running national monitoring and evaluation. Much of this funding went to support hiring monitoring and evaluation staff in the national AIDS council.<sup>36</sup> MAP funds have also been used to train officials in the health ministry, starting with 25 health district management teams in 2004 and then expanding to other districts. Other inputs supported by the MAP include support for the Demographic and Health Surveys and for hiring monitoring and evaluation consultants.

No specific information was obtained in Mozambique about how the MAP supports monitoring and evaluation capacity building.

*In all three countries studied the MAP was designed to use existing government information systems—but, in practice, requires some additional information for its own purposes.* In Mozambique the MAP uses indicators identical with those of national AIDS strategy, but requires reporting on them outside the general reporting systems used to process data for other AIDS and health programs (including the health information systems). The MAP also requests information on activities being implemented to achieve targets for each MAP project. Such requests add to the health ministry's reporting burden at the central level (though not at other levels).

In Uganda, the MAP's data collection needs were designed (like the Global Fund's programs) to be met through the government's

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36. NAC 2005.

health information systems—but some financial and program indicators for the MAP could not be collected through the government systems, so the MAP collected data on them separately. (The move was also made partly to expedite the flow of information, since routine data takes time to be channeled up the health management information system chain.)

In Zambia the MAP collects additional information because the health information system and the national HIV/AIDS monitoring and evaluation framework—which the program was initially designed to use—have yielded incomplete data. To fill the gaps the MAP supports independent evaluations that collect and analyze added information.

*The data collected and reported through health information systems (which the MAP supports) are generally considered to be incomplete and of low quality.* The reasons—varying from country to country—range from inadequate processes and supplies for recording information to weak incentives for health workers to participate in data collection. In Mozambique, Uganda, and Zambia, registers filled at health facilities are producing data that are incomplete and of a quality lower than that required by donors. The causes include:

- A lack of staff.
- A lack of staff incentives.
- A lack of register stationery.
- Old, outdated forms on which information categories have not been revised.
- Inconsistency between systems that rely partly on computers and partly on manual filing.
- Data that is incomplete because of how it gets aggregated upstream—from the facility to the district to the national health ministry.

The demand that data be complete also conflicts with the demand for timely submission. To submit information on time, districts often report data upstream that is incomplete because of delayed reports from facilities.

*The MAP's monitoring and evaluation captures information about programs that the MAP*

*supports.* The processed information (not just the data collected) is then shared with governments. The MAP (like the Global Fund) relies on government systems for much of its data, so sharing the data with governments is not an issue. More interestingly, World Bank offices package the information in Bank reports that are often disseminated through technical working groups and in-country policy meetings. The MAP's reporting data thus can reach a fairly wide audience—though the Bank does not post the reports online, which would make access even wider and easier.

## Recommendations

This chapter's recommendations focus on how the three donors could improve their approach to information needs for HIV/AIDS. (Later recommendations in the final chapter of this report will focus on how the donors should seize the present opportunity to strengthen health information systems, even as they continue to gather information related to HIV/AIDS.)

### PEPFAR should:

*Reduce the reporting burden for district facility health workers by integrating PEPFAR's data collection requirements with each government's.* PEPFAR could work with governments and other donors to ensure that health workers fill out one set of forms, which would be fed into the health information system for all users at each level of the system, including donors. HIV/AIDS information should not be privileged over information on other health programs—as it is when PEPFAR pays health workers to report high-quality information only for HIV/AIDS and only for PEPFAR.<sup>37</sup> Recent information suggests that reducing reporting burdens is a priority for PEPFAR, and that it has begun collaborating with the

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37. Personal communication with the Office of the U.S. Global AIDS Coordinator indicates that, in the fiscal 2009 Country Operational Plan guidance, PEPFAR directed its country teams to describe their plans for moving away from PEPFAR-only reporting systems toward a single national reporting system.

Health Metrics Network<sup>38</sup> to develop a baseline data management assessment tool. Such a tool would enable governments to systematically inventory and analyze the instruments it uses to collect data related to HIV/AIDS, the data collected, the reports generated, the relationships between forms and reports, and the relationships between collectors and users. The results should provide insight into how to reduce data collection burdens by making the most of existing data creation methods, forms, work flows, and approaches to data communication.<sup>39</sup>

*Share information systematically and regularly with governments and other country stakeholders.* Information that PEPFAR collects from the health management information system and other parts of the health information system is processed for its own monitoring purposes. But the reports would also be valuable to governments and other stakeholders, enabling a more coordinated HIV/AIDS response—particularly since PEPFAR supports much of the response in each of the three countries studied. Where PEPFAR supports nongovernmental programs it should also share this information with health ministries and with national AIDS councils on a quarterly basis. In addition to sharing the results directly with the government and other country stakeholders, PEPFAR could publish

more country-specific monitoring data on its website, to help others track the progress of each country's response to HIV/AIDS.<sup>40</sup>

**The Global Fund should:**

*Ensure that primary recipients include clear objectives and indicators for strengthening monitoring and evaluation systems in their proposals for Phase 2 (if not earlier).* That would drive primary recipients to systematically address weaknesses and measure improvements in health information system capacity during phase 1—an especially important process for countries starting out with resource gaps that limit their ability to strengthen such systems.

**The MAP should:**

*Ensure that basic supplies (such as registers and updated forms) are available, and that monitoring and evaluation staff are trained to feed high-quality data rapidly into national health management information systems and other information systems.* Since the MAP chiefly relies on country information systems, it should work with governments to give priority to activities that will strengthen those systems—and to measure the improvements that result. Doing so will visibly strengthen each country's ability to collect and process high-quality data to track and evaluate its HIV/AIDS response.

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38. For more information on country health information systems, see the Health Metrics Network website (<http://www.who.int/healthmetrics/support/en/>).

39. Personal communication with the Office of the U.S. Global AIDS Coordinator.

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40. Although PEPFAR instructs U.S. government country teams to organize or attend data reconciliation meetings with appropriate stakeholders in-country—to review indicators before submission of the PEPFAR annual and semiannual progress reports—this was not observed at the country level by our researchers.

**Table 2.1 Summary of donor interaction with country health information systems in Mozambique, Uganda, and Zambia**

<b>Country health information system component</b>	<b>PEPFAR</b>	<b>The Global Fund</b>	<b>The MAP</b>
<b>Health information system resource inputs</b>	<p>Has designated posts in monitoring and evaluation in the health ministry and provincial levels in Mozambique.</p> <p>Supports monitoring and evaluation training in Uganda.</p> <p>Participates in the Joint Annual Programme Review in all three countries studied.</p> <p>Gives health workers incentives to collect high quality data—creating a competition for human resources to manage information systems.</p> <p>For Zambia, supports SMARTCare (information technology inputs). For Uganda, provides technical assistance and computer support to the health ministry to improve data collection, processing, and transmission.</p>	<p>Lets its funds be programmed to health management information system strengthening (with such indicators as the number of service deliverers trained in monitoring and evaluation and the percentage of the budget spent on monitoring and evaluation). Zambia is an example.</p>	<p>In all three countries studied the MAP provides training, computers for data collection, support for the Demographic and Health Surveys, and management capacity building—but these inputs are not systematically described or measured.</p>
<b>Data management</b>	<p>Sets up parallel structures to collect, store, and analyze information in all three countries studied. (The most extreme case, Monitoring and Evaluation of Emergency Plan Progress, while good for PEPFAR, is not strengthening Uganda's health information system.)</p> <p>Adds to reporting burdens for district and lower-level facility staff.</p> <p>Gives health workers an incentive to collect high quality data only for PEPFAR purposes—creating a competition for human resources to manage information systems.</p>	<p>Uses country health management information systems and other national information systems.</p> <p>Whether the Global Fund assures high-quality data collection through the country's health information systems is not clear.</p>	<p>Uses country health management information systems and other national information systems.</p> <p>Whether the World Bank assures high-quality data collection through the country's health information systems is unclear.</p>
<b>Data sources and indicators</b>	<p>Collects its own financial data.</p> <p>Population data from Demographic and Health Surveys and other surveys; contributes to national serosurveys and Demographic and Health Surveys.</p> <p>Program data is a mix of country health information system data and PEPFAR's own data.</p> <p>Requires its own indicators for its own purposes, but draws information from the health management information system as needed.</p>	<p>Collects its own financial data.</p> <p>Draws population data from existing surveys.</p> <p>Draws program data largely from the health management information system, but with additional indicator requirements.</p> <p>Requires additional information to be collected, adding to the reporting burden.</p>	<p>Requires financial data to be reported according to its own format.</p> <p>Population data are drawn from existing survey databases.</p> <p>Draws program data largely from the health management information system, but with additional indicator requirements.</p> <p>Requires additional information to be collected, adding to the reporting burden.</p>
<b>Using and sharing information</b>	<p>Uses information solely for the COPRS database and PEPFAR country team reports to assess PEPFAR results.</p> <p>Does not share information systematically with the government and other donors; does not share information with the people who collect data, so incentives to collect data are few.</p>	<p>Uses information to make continued disbursement decisions based on performance assessments.</p> <p>Makes data available to countries.</p> <p>Publishes almost all information online.</p>	<p>Uses information with a strong emphasis on financial accountability and recipient reporting.</p> <p>Makes data available to countries.</p> <p>Shares information with governments, but not publicly.</p>

Note: The summary does not describe all three donors' activities in the three countries studied. Only activities and approaches that donors reported on—and for which information was available about all three donors for all three countries—are described.  
 Source: Authors' analysis of data as described in text.

# 3

## Supply chain systems for drugs

Mozambique, Uganda, and Zambia—like many countries in Africa—have several supply chains for health commodities. The degree of interconnection between the chains differs across different commodities and across different countries. Within a country, separate supply chain systems often exist for various commodities; for example, different systems can exist for essential medicines, vaccines, tuberculosis drugs, antiretrovirals, and laboratory commodities. Moreover, each system can include several supply chains operated by different actors. For essential medicines in Zambia, the government, civil society (primarily faith-based groups), and the private for-profit sector all have separate but interconnected systems for procuring and distributing essential medicines.<sup>41</sup> A country's government and its civil society actors can use various supply chain management processes, depending on what sources have financed the purchase of particular commodities.<sup>42</sup>

This chapter describes the relationship between two specific supply chain systems in Mozambique, Uganda, and Zambia. The first system is the donor-supported supply chain system for antiretrovirals—a good that consumes the largest share of most AIDS donors' procurement budgets. The second system is each government's supply chain system for essential medicines.<sup>43</sup> Of all the systems for procuring and distributing health commodities in a country, the public supply chain system for essential medicines includes by far the most drugs (typically more than 500). It is thus the closest to a national

system; in other words, it is the most horizontally integrated. (For a summary of supply chain systems for essential medicines and for antiretroviral drugs in the three countries studied, see table 3.1 near the end of this chapter).

In examining the relationship between supply chain systems for antiretroviral drugs and for essential medicines, the chapter will focus on five particular supply chain functions: selection, forecasting and quantification, procurement, storage and distribution, and logistics information management (box 3.1).

HIV/AIDS donors should be concerned about their effects on the supply chain systems for essential medicines (and other health commodities) for several reasons. First, without health products, there can be no health programs. Properly functioning supply chains are key to ensuring that products reach the right places, at the right times, and in the right quantities. Second, the supply chains for antiretrovirals and essential medicines rely on many of the same resources, such as physical infrastructure,

41. Yadav forthcoming.

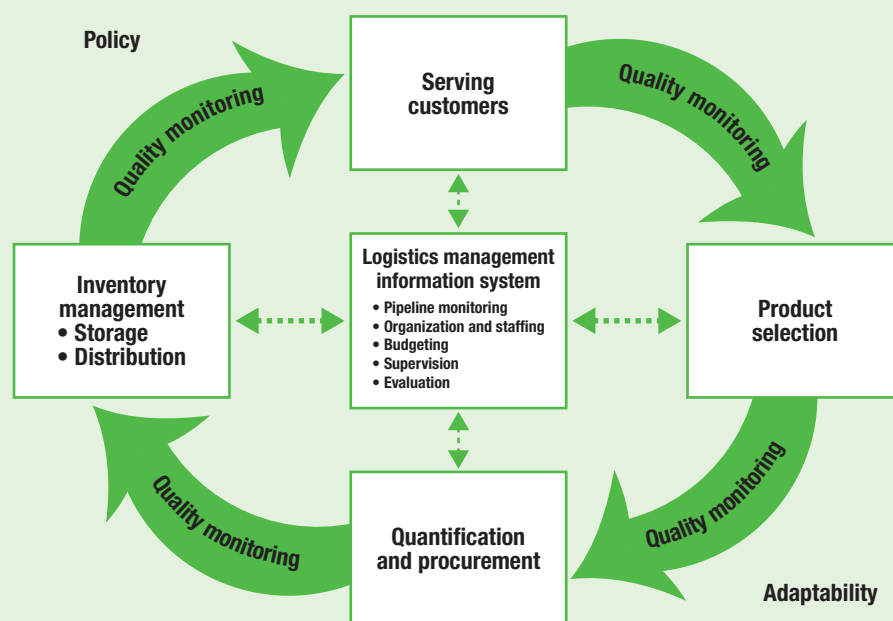
42. Much of the procurement conducted by the government and by civil society is funded by international donors. Each donor tends to have its own rules about how its recipient must conduct supply chain activities. The rules for PEPFAR, the Global Fund, and World Bank MAP are outlined in this section.

43. Antiretrovirals are considered essential medicines in most countries, but for the purpose of illustrating the separate supply chain procedures, in this chapter antiretrovirals are discussed separately from other essential medicines.

The supply chain is a series of steps for moving health commodities from manufacturers to clients. Efficient supply chain systems are critical to global health programs. A supply chain system has several key functions that are interdependent and that together compose the logistics cycle (see box figure):

- *Selection.* Product selection ensures that the right product is purchased to meet customers' needs. To select the right health care products, clear criteria must be asserted for quality and effectiveness in treatment, for disease burdens, and for affordability. Most countries use national essential medicines lists based on the World Health Organization model list.<sup>1</sup>
- *Forecasting and quantification.* Forecasting estimates the quantities of a product that a program will dispense to users over a future period—often using data on past consumption, standard treatment guidelines, and available financing. Quantification determines how much of a good is needed to ensure enough stock, including buffer stock.
- *Procurement.* When effective, procurement includes financing the purchase of supplies; preparing bid and tender documents; managing the tendering and bidding process; maintaining transparency and accountability in all transactions; ensuring safe, quality products; and monitoring the performance of suppliers and the range of procurement processes.
- *Storage and distribution (inventory management).* Stored until they are needed, health care products are then distributed to health facilities, often through regional or district warehouse networks.
- *Use (serving customers).* Once at facilities, health commodities are used by staff to serve the people who need them.
- *Logistics management information system.* Central to the logistics cycle, the logistics management information system collects and reports data about the flow of commodities. Such a system allows program managers to manage and monitor supplies, to make decisions about ordering products, to forecast future demand, to resupply health facilities that are running low on products, and much more. Three types of data in a logistics management information system are the amount of a product dispensed to users, the amount of stock at a facility, and the amount of a product no longer at facilities for reasons other than use (loss, theft, redistribution).

#### Key supply chain functions in the logistics cycle



**Note:** This report focuses on product selection, quantification, procurement, and inventory management. It does not examine use (serving customers).

1. See World Health Organization prequalification project website at <http://healthtech.who.int/pq/>.

**Source:** The DELIVER Project 2006d.

information systems, and health sector staff. HIV/AIDS programs must avoid using those resources in ways that detract from a country's simultaneous ability to operate a well functioning supply chain for essential medicines. Third, where the processes and the technical knowledge needed in both supply chains are quite similar, integrating functions in both chains might reduce costs and use resources more efficiently.

Although each of the three donors has its own supply chain management procedures, all three have worked closely with governments to develop supply chains for antiretroviral drugs that largely rely on the public sector. Still fairly small, those supply chains generally work more smoothly than the much larger government-managed supply chains for other essential medicines. Though the antiretroviral and essential medicine systems are largely distinct, they clearly interact for certain supply chain functions—particularly storage, distribution, and logistics information management (figure 3.1).

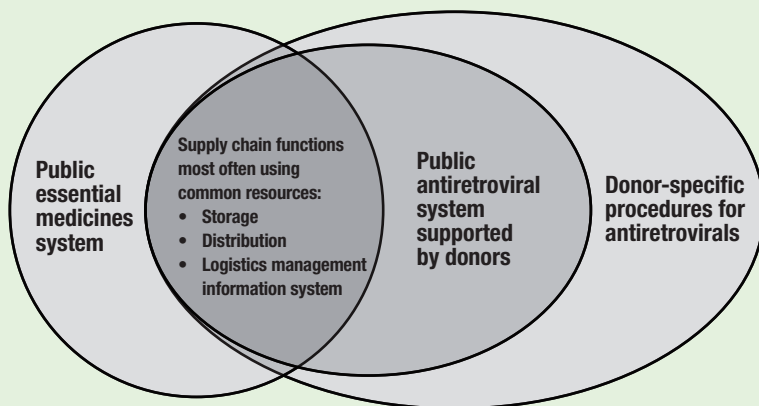
### Government supply chain systems for essential medicines

*The governments in all three countries studied have worked with global donors and in-country stakeholders to develop systems for procuring and distributing essential medicines; such systems rely primarily on the health ministries and central*

*medical stores.* Although each country's system differs, the steps in the logistics cycle can be generally summarized as follows:

- **Selection.** A government entity within the health ministry—such as a pharmacy department or a national formulary and therapeutics committee—regularly updates a list of essential drugs (drugs considered most necessary to keep in stock) based on the World Health Organization's model list.<sup>44</sup>
- **Forecasting and quantification.** Typically carried out by the health ministry or by the central medical stores, this process is most often completed using data on the quantities of drugs issued to health facilities or ordered by them for past periods (or both). Information gaps generally prevent the use of data on drug consumption by patients.
- **Procurement.** The health ministry works closely with development partners to plan procurement for essential drugs. Some drugs are donated by donors. Others are purchased directly by the government. Still others are purchased, on the government's behalf, by procurement agents.
- **Storage and distribution.** Drugs arriving in the country are stored in a central warehouse overseen by the central medical stores, which are responsible for managing drug stocks and distributing them to health facilities (often through regional or district warehouses).<sup>45</sup> Drugs are distributed using a “push” system, a “pull” system, or both.<sup>46</sup> The central

Figure 3.1 **Overlaps among standard government supply chains for essential medicines and donor-funded supply chains for antiretrovirals**



Source: Authors' construction.

44. The World Health Organization defines essential medicines as “drugs that satisfy the health care needs of the majority of the population; they should therefore be available at all times in adequate amounts and in appropriate dosage forms, at a price the community can afford” (<http://www.who.int/medicines/publications/essentialmedicines/en/>). The Model List of Essential Medicines is also on the Organization's website ([http://www.who.int/medicines/publications/08\\_ENGLISH\\_indexFINAL\\_EML15.pdf](http://www.who.int/medicines/publications/08_ENGLISH_indexFINAL_EML15.pdf)).

45. In Zambia and Mozambique, management of the central medical stores has been outsourced. Crown Agents manages the central medical stores in Zambia; Medimoc manages the central medical stores in Mozambique.

46. In a push system the amount of drugs shipped from central medical stores to districts and facilities is determined at central medical stores. In a pull system shipments are made from central medical stores based on orders made by health facilities.



medical stores distribute largely to public health facilities, but they may also distribute to other facilities needing supplies. In addition, the central medical stores tend to coordinate their distribution with nongovernmental and faith-based distributors to ensure that all facilities—public and private—have reliable medicine supplies.

- *Logistics management information systems.* Logistics management information systems are weak in all three countries because data on drug usage at facilities is rarely available. The central medical stores must rely mostly on data about issued drugs when carrying out forecasting and quantification.

*Supply chain systems for essential medicines have changed greatly in recent years, including through the integration of previously separate supply chains for different commodities.* Still, weaknesses in the systems have led some donors to continue supporting separate systems for certain drugs and diseases—including HIV/AIDS. Throughout much of the post-independence period many African countries—including Mozambique, Uganda and Zambia—relied largely on donors to procure health commodities and donate them to health ministry programs. More recently, budget support and sector-wide approaches have changed health commodities procurement in two large ways. First, governments have begun handling more procurement of health commodities, including essential medicines. Second, supply chain systems for specific programs—family planning, sexually transmitted infections, and so forth—have been increasingly integrated into larger, more complex supply chains that handle hundreds of products.<sup>47</sup>

The integration of supply chains that are disease-specific, or “vertical,” into larger, more complex chains is happening fairly quickly in Mozambique and Zambia, less quickly in Uganda. Still, some donors have continued to support partly or wholly separate supply chains because of enduring weaknesses in the supply chain systems for essential drugs in all three countries. In Uganda procurement and distribu-

tion problems have caused regular stockouts of some drugs.<sup>48</sup> Zambia has no fully functioning logistics management information system for essential medicines because data on drug usage from individual health facilities is not transmitted to the central medical stores.<sup>49</sup> Such weaknesses in government systems have led some donors to support partly or wholly separate procurement arrangements.<sup>50</sup>

### **Public supply chain systems for antiretroviral drugs—supported by donors**

*PEPFAR, the Global Fund, and World Bank MAP worked closely with governments to establish new supply chain systems for antiretrovirals.* Before the donors’ arrival the only antiretrovirals available in Mozambique, Uganda, and Zambia were being sold in the private sector at fairly high costs. Funding from the donors made it possible to provide free antiretrovirals to large portions of the population, chiefly through public health facilities. The donors and the governments (with other country stakeholders) worked together to develop appropriate policies and procedures for antiretroviral supply chain management.

The three donors discussed in this report—especially PEPFAR and the Global Fund—provide a large share of the funds to support antiretroviral procurement and distribution.

*The antiretroviral supply chain system is designed to mainly use public-sector structures, but donors also have their own procedures for certain supply chain functions* (see table 3.1). Although each country contains exceptions, the governments and the donors are coordinated at each step in the antiretroviral logistics cycle to the extent indicated below.

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48. Nazerali and others 2006.

49. Global Fund Grant Scorecard for Ministry of Health’s Round 2 Grant. Instead, health facilities—with the exception of hospitals—report data on usage and stock levels to their district governments, which then forward information about the quantities of available stocks and the quantities needed for resupply in the districts.

50. Aronovich and Kinzett 2001.

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47. The DELIVER project 2006d, 2006b.

- *Selection.* A government-established committee—typically under the health ministry—consults with stakeholders to determine which antiretrovirals should be included in the standard treatment guidelines. To ensure that all antiretrovirals on the list are of sufficiently high quality, the governments rely on the standards established by the World Health Organization’s prequalification of medicines project.<sup>51</sup> Typically antiretrovirals that are placed on the standard treatment guidelines are also added to the essential medicines list.
- *Forecasting and quantification.* The government and donors are increasingly working together to conduct joint forecasting and quantification, but some donor-financed recipients outside the government conduct their own forecasting.
- *Procurement.* The government and donors coordinate which funding sources will be used for which procurements. Most procurement, being funded by donors, is conducted according to each donor’s specific guidelines or procedures.
- *Storage and distribution.* Once drugs arrive in the country the vast majority are stored at the central medical stores. They are then distributed to health facilities (both public and private) that the government has accredited to provide antiretroviral therapy. Some donor-financed recipients use their own distribution systems.
- *Logistics management information system.* A logistics management information system is used to collect data (such as on the quantities of antiretrovirals delivered and used at each health facility). Each country’s system is set up differently, but generally it is overseen by the central medical stores. Donor-funded antiretrovirals are tracked using the

logistics management information system, except in cases where recipients of donor money distribute drugs outside the central medical stores system.

*Antiretroviral supply chain systems are largely separate from those of essential medicines, although links between the two systems exist for certain supply chain functions—particularly for storage and distribution and for logistics information management* (see table 3.1). For most antiretrovirals, selection and quantification and procurement are conducted independently from the system for essential medicines (Mozambique presents some exceptions). In later stages of the logistics cycle—those that follow procurement—antiretroviral supply chain systems interact more closely with essential medicines systems.

Most antiretrovirals and essential medicines are stored and distributed by the central medical stores. In some cases the transportation of the two sets of drugs is integrated. In Zambia, for example, antiretrovirals and essential medicines are delivered to health facilities on the same trucks. In Mozambique the antiretrovirals are delivered separately to provincial warehouses (often by airlifting), but they then continue along the standard distribution system for essential medicines. Only in Uganda is antiretroviral distribution mostly separate—the antiretrovirals are supposed to have their own dedicated trucks for direct delivery to health facilities.<sup>52</sup>

The logistics management information systems for antiretrovirals partly interact with the corresponding systems for essential medicines. In Mozambique antiretroviral logistics management is being integrated into the existing system for essential medicines. In Zambia and Uganda no properly functioning logistics management information system existed for essential medicines, so separate systems were established for antiretrovirals. But essential

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51. The prequalification project evaluates and inspects drugs for AIDS, malaria, and tuberculosis that are submitted for approval by drug manufacturers. If deemed of acceptable quality the drugs are then approved and placed on a list of prequalified medicines. Many national governments (and other buyers) in the developing world use this list as a way to ensure that drugs are of sufficiently high quality for purchase. For details, see the prequalification project’s website (<http://healthtech.who.int/pq/>).

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52. Despite this plan, dedicated trucks were not always used. In some cases, trucks used to deliver other essential medicines were also being employed to deliver antiretrovirals, but using a different delivery system (antiretrovirals are delivered monthly, essential medicines bimonthly).

medicines systems are being developed and, in time, might be integrated with the systems for antiretrovirals (box 3.2 gives details on Zambia's approach).

*Antiretroviral supply chain systems are generally more robust than essential medicine systems—mostly because they are smaller and better funded.* The supply chain systems for antiretrovirals generally function quite well, with very few stockouts. That is largely because antiretroviral supply chains are much better funded than essential medicines supply chains, even as they serve far fewer health facilities. In 2007 Uganda's central medical stores were distributing essential medicines to more than 1,900 facilities, while they were providing antiretrovirals to just 220. Zambia's antiretroviral supply chain system is pictured in figure 3.2.

The following sections describe key features of each donor's approach to four parts of supply chain management—selection, forecasting and quantification, procurement, and storage and distribution—and explain its efforts to strengthen supply chain systems.<sup>53</sup>

53. The logistics management information system is not discussed below because all three donors' programs generally use the logistics management information systems employed by the central medical stores (except in cases where their recipients are distributing drugs outside of the central medical stores system).

### **PEPFAR: procuring antiretrovirals separately, but with concerted technical assistance for improving antiretroviral supply chains**

*Since PEPFAR's quality standards differ from those of host country governments (and other AIDS donors), it cannot always procure the first-line antiretrovirals that a government would prefer to select.* To ensure high-quality antiretrovirals, governments in all three countries studied select drugs for purchase from the World Health Organization's prequalification project. Although most donors accept the project as an adequate quality standard, PEPFAR uses a different quality standard: it can only purchase drugs that are approved by the U.S. Food and Drug Administration.

In the early years of PEPFAR, this Food and Drug Administration approval requirement was a significant challenge. Almost none of the less expensive generic first-line drugs that governments preferred had been approved by the Food and Drug Administration. So PEPFAR focused largely on procuring second-line and pediatric drugs, categories for which generics were less readily available—leaving much first-line drug procurement to other financing sources.<sup>54</sup>

54. PEPFAR 2004a, b, c–2007a, b, c. Also see the DELIVER project 2007a.

#### **Box 3.2 Logistics management information systems in Zambia**

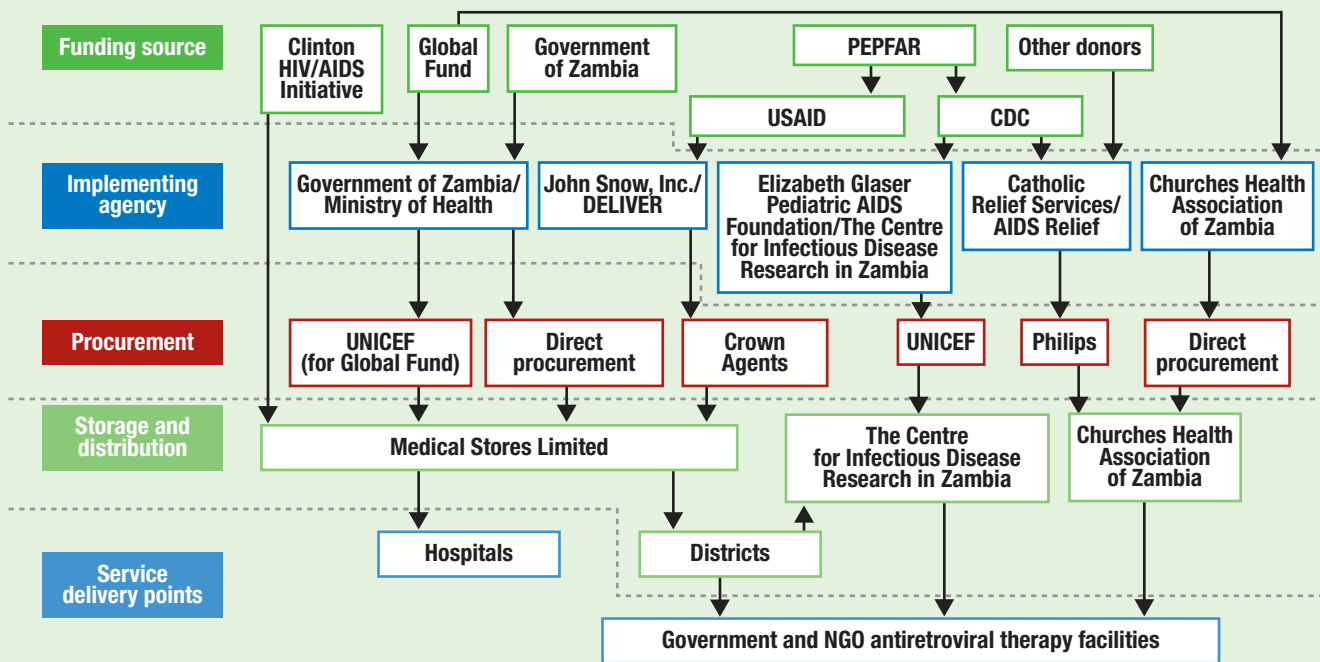
The logistics data for essential medicines in Zambia have had significant limitations. The central medical stores' logistics management information system gathered data primarily from large hospitals and district storage facilities—not from individual facilities at the district level. So, the national medical stores did not have data on the quantities of products consumed, or on hand, at facilities such as health centers and health posts.

When funds for antiretroviral treatment began to flow, donors led by the Global Fund encouraged Zambia's health ministry to establish a logistics information system that could track antiretrovirals more closely. The government, with support from the PEPFAR-funded DELIVER project, responded to those concerns by establishing an antiretroviral-specific logistics management information system to track consumption data for all accredited antiretroviral treatment facilities. A separate unit in the central medical stores (Medical Stores Limited), the Logistics Management Unit, was established to manage the data from this new information system and to use state-of-the-art software to determine when and what to ship to facilities to help keep antiretrovirals in stock at all times.

The central medical stores are planning to use the new system for antiretrovirals as a potential model for improving the logistics management information system for essential medicines and other health commodities.

**Source:** Cheelo and others forthcoming; personal communication with senior official at Zambia's central medical stores.

Figure 3.2 The antiretroviral supply chain system for Zambia



Note: CDC is the U.S. Centers for Disease Control. Since 2005, this picture has changed somewhat. For example, the implementing agency Government of Zambia/Ministry of Health now uses Crown Agents for procurement rather than UNICEF and direct procurement; USAID now uses SCMS as the implementing agency and for procurement; and Catholic Relief Services/AIDS Relief procurement through Philips goes to Medical Stores Limited for storage and distribution rather than to the Churches Health Association of Zambia.

Source: Authors' construction from data as described in text.

In recent years the situation has begun to change as the Food and Drug Administration approves more generic drugs. Most of the PEPFAR-financed drugs purchased in all three countries are now generics.<sup>55</sup> Still, the difference between PEPFAR's standard and those of governments and other donors poses a coordination challenge.<sup>56</sup>

55. In 2007 the value of generic drugs purchased in Mozambique—relative to the total value of antiretrovirals purchased in the country—was 77%; in Uganda it was 44%; in Zambia it was 79%. The relative volume of generic drugs among purchased antiretrovirals was likely higher, since generic drugs cost less than originator versions. See PEPFAR 2008.

56. PEPFAR and the U.S. Food and Drug Administration have taken some important steps to mitigate the coordination challenge. The Food and Drug Administration has signed a confidentiality agreement with the World Health Organization prequalification project that hastens the inclusion on the prequalification list of generic antiretrovirals that the Administration has approved. Furthermore, the Global Fund now accepts Food and Drug Administration approval as quality assurance for drugs purchased with Fund money.

PEPFAR works with governments and other partners to establish or strengthen country forecasting systems for antiretrovirals (and for other medicines in Mozambique).<sup>57</sup> In Mozambique PEPFAR helped the central medical stores automate their forecasting and quantification and shipment systems for all medicines, including antiretrovirals. In Uganda PEPFAR's Supply Chain Management System project (box 3.3) has provided technical assistance to strengthen forecasting by the health ministry and several other nongovernmental HIV/AIDS drug procurers.<sup>58</sup> In Zambia PEPFAR funded John Snow, Inc.'s DELIVER project to develop the country's first national antiretroviral forecasting and quantification plan. Formed in consultation with key members of the government and donor community, the plan is updated each

57. In addition to its work with the government, PEPFAR recipient organizations that procure drugs themselves also do their own forecasting and quantification.

58. PEPFAR 2007b.

### The USAID | DELIVER Project and the Supply Chain Management System: PEPFAR recipient organizations delivering technical assistance for public supply chain management

PEPFAR provides significant resources for technical assistance. For supply chain management it has relied largely on two recipient organizations to provide such technical assistance: the USAID | DELIVER Project and the Supply Chain Management System.

*The USAID | DELIVER Project.* Implemented by John Snow, Inc., the USAID | DELIVER Project aims to strengthen developing countries' supply chains for health commodities.<sup>1</sup> It provides technical assistance for all stages of the logistics cycle, from forecasting to distribution, for a broad range of health commodities including essential medicines, reproductive health products, and HIV/AIDS drugs. In Mozambique, Uganda, and Zambia it has trained government staff in logistics management; developed operating procedures for storage and distribution; and installed software to help with stock management and forecasting and quantification. The project can also conduct procurement on behalf of PEPFAR recipients or host country governments. At times it offers technical assistance for a specific disease, such as HIV/AIDS—but much of its technical assistance to Mozambique, Uganda and Zambia has been for health commodities generally.

*The Supply Chain Management System.* A consortium of 17 organizations led by John Snow, Inc., the Supply Chain Management System was awarded central funding by PEPFAR to help ensure an uninterrupted supply of HIV/AIDS commodities to PEPFAR countries. Some of its operating expenses are funded centrally by PEPFAR, but PEPFAR country offices or recipients hire it to perform various supply chain functions. The system can procure drugs through its own supply chain; it can also provide assistance to countries and other PEPFAR recipients in any part of supply chain management. The system operates in all 15 PEPFAR focus countries. Two unique features of the system are:

- The system has prenegotiated prices for AIDS commodities with international suppliers. Organizations can immediately learn the price for a particular good at the system's website (<http://scms.pfscm.org/scms>).
- To serve PEPFAR's Africa focus countries with quick and frequent shipments, the system has established regional distribution centers in Ghana, Kenya and South Africa. Using such centers avoids overloading local storage space. Also, countries at risk of being stocked out can receive commodities quickly (in less than one month).

In the last two years, as the Supply Chain Management System has gained experience, some of the activities for strengthening HIV/AIDS commodity supply chains previously carried out by the USAID | DELIVER project (or its precursor, the DELIVER project) have been transferred to the newer Supply Chain Management System.

#### Note

1. The USAID | DELIVER Project is a follow-on project to the DELIVER project which ended in 2006. Both projects are funded by USAID, are implemented by John Snow, Inc., and offer many of the same services. For simplicity, much of this report uses the term *USAID | DELIVER Project* to refer to both the present project and the DELIVER project that preceded it.

**Source:** USAID | DELIVER Project website ([www.jsi.deliver.com](http://www.jsi.deliver.com)); Supply Chain Management System website (<http://scms.pfscm.org/scms>).

quarter by John Snow, Inc. with input from various stakeholders. The government's central medical stores are intended, sooner or later, to begin overseeing the forecasting.

*PEPFAR and its recipient organizations do their own antiretroviral procurement, with most of the drugs being delivered to central medical stores.* In all three countries studied PEPFAR procures large quantities of antiretrovirals, primarily through the Supply Chain Management System project. The drugs are delivered primarily to central medical stores for eventual distribution to public and private health facilities. To avoid

duplication the drugs are procured in coordination with health ministries and other donors procuring antiretrovirals, such as the Global Fund, the MAP, and the Clinton Foundation.

Besides delivering drugs to central medical stores, some PEPFAR recipient organizations also procure their own drugs and distribute them to health facilities. In Uganda, for example, the PEPFAR-supported Joint Clinical Research Center procures and distributes its own drugs. So do Catholic Relief Services and the Elizabeth Glazer Pediatric AIDS Foundation in Zambia.<sup>59</sup>

59. PEPFAR 2007c.

Multiplying procurement entities can be a double-edged sword. On the one hand it can help avoid stockouts, since drugs procured through one supply line can make up for a shortage in another. On the other hand, multiplying procurement entities can lead to duplication and inefficiencies. In one instance, in Uganda, a PEPFAR-funded project procured pediatric AIDS drugs and distributed them at public health facilities even as the Ministry of Health had also procured drugs for the same purpose. When the publicly financed drugs arrived they were deemed redundant, and they were eventually donated to another country where they could be used more quickly.<sup>60</sup>

*PEPFAR often stores antiretrovirals in central medical store warehouses—then works closely with the central stores to distribute antiretrovirals to health facilities.* In Mozambique, where PEPFAR-funded antiretrovirals are delivered to central medical store warehouses, the government then takes charge of storing and distributing them with technical assistance from PEPFAR's Supply Chain Management System. Antiretroviral delivery is partly integrated into the system for other health medicines.<sup>61</sup> In contrast, Uganda's system for antiretroviral storage and distribution is more specialized. Antiretrovirals are stored both in the central medical stores, which distribute antiretrovirals mostly to government facilities, and in a warehouse facility (the Joint Medical Stores) that distributes mainly to non-governmental organizations.

After PEPFAR-funded antiretroviral drugs are sent to Zambia's central medical stores their storage and distribution are managed by the Logistics Management Unit, a stores special unit dealing exclusively with antiretrovirals. The unit is supported by John Snow, Inc.'s USAID | DELIVER project, which receives PEPFAR funds to help the central medical stores distribute the drugs efficiently. Health ministry officials interviewed for this report said that the close relationship between the Logistics Management

Unit and John Snow, Inc. has sometimes caused the ministry to be excluded—for example, when it is not given detailed information about the quantities of drugs shipped to public health facilities.<sup>62</sup> In response, officials at central medical stores and PEPFAR emphasize that feedback reports containing logistics data are circulated monthly to all provinces and districts.<sup>63</sup>

*PEPFAR has provided central medical stores with extensive technical assistance to improve antiretroviral storage and distribution.* In Mozambique several important software packages to help with stock management, forecasting and quantification, and ordering essential medicines—including antiretrovirals—were installed with PEPFAR money and other U.S. government funds.<sup>64</sup> In Uganda PEPFAR hired a consultant to help the central medical stores redesign the health ministry's storage systems, to make them more efficient and to avoid wasting drugs (a problem in the past). Through the USAID | DELIVER Project, PEPFAR has also trained hundreds of staff to use the antiretroviral logistics management information system in the health ministry, health facilities, and elsewhere. In Zambia the USAID | DELIVER Project's technical assistance to the central medical stores included installing software for inventory control, developing operation manuals for using the antiretroviral logistics system, and training facility workers to use the logistics management information system.

*PEPFAR has coordinated its procurement with governments and other stakeholders increasingly well, acting to avoid stockouts and providing technical assistance to support procurement by others.* Since PEPFAR does not use government systems for its procurement, sharing information is critical to help governments coordinate various drug procurements and to conduct

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60. Personal communication with PEPFAR recipient organization official, June 18, 2008.

61. PEPFAR 2006a.

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62. Cheelo and others forthcoming.

63. Personal communication with official at central medical stores, June 2, 2008, and mimeograph from the Office of the U.S. Global AIDS Coordinator, submitted on June 19, 2008.

64. Costa and Antunes forthcoming.

their own. Key informants suggested that PEPFAR did not share enough information in its early years, but has since been improving its coordination with governments. In Mozambique coordination has been especially strong: the Supply Chain Management System has worked with the government on behalf of the Global Fund, PEPFAR, and the MAP to establish a coordinated and regularly updated procurement plan.<sup>65</sup> PEPFAR officials also participate in the health ministry's procurement working group. In Uganda PEPFAR has worked very closely with the government, the Global Fund, and the MAP to avoid possible stockouts. When Fund grants were suspended PEPFAR stepped in to fill the resulting antiretroviral procurement gap.<sup>66</sup>

In Zambia an assessment by John Snow, Inc. revealed at least seven different logistics systems used by the government, by donors, and by others procuring antiretrovirals. PEPFAR hired the DELIVER project to create a plan for consolidating the systems.<sup>67</sup> The DELIVER project reports having worked closely on that plan with the government and donors. Still, the plan did not address how PEPFAR was conducting procurement. Some Zambian health ministry officials reported that information about PEPFAR procurement plans and processes had not been readily available to them, and that PEPFAR had resisted the ministry's requests to be included in its procurement process.<sup>68</sup>

*PEPFAR has given the governments of Uganda and Zambia technical assistance with supply chain management proposals and plans for Global Fund grants.* In Uganda PEPFAR's DELIVER project helped the government prepare supply chain management components for more than \$240 million in approved Fund grants. In Zambia the DELIVER project helped with proposal development, helped to prepare procurement and supply chain plans submitted to the Fund,

and offered procurement technical assistance to Fund primary recipients.<sup>69</sup>

*In Mozambique PEPFAR has helped strengthen the supply chain system for all medicines, but in Uganda and Zambia its systems strengthening activities are focused on antiretroviral supply—not broader health commodities.* PEPFAR invested in developing and installing a series of important software packages for logistics management in Mozambique. All can be used for supply chain systems for all medicines—not only antiretrovirals. To further improve overall supply chains for health commodities, PEPFAR has trained hundreds of staff in logistics procedures, hired logistics advisors in several provinces, and invested in expanding Mozambique's warehouse capacity.

In Uganda and Zambia the story is different. PEPFAR has invested in greater warehouse capacity, but has narrowly focused most of its other systems strengthening activities on the antiretroviral supply chain. For example, in Zambia John Snow, Inc.'s DELIVER project developed an inventory and stock tracking system and trained more than two hundred health sector staff in using it—but it was not used for drugs other than antiretrovirals.<sup>70</sup> Zambian health ministry officials report that PEPFAR has rebuffed requests to help strengthen the broader supply chain system for health commodities: a claim that could not be checked with PEPFAR officials in Lusaka, who were unwilling to be interviewed for this report.<sup>71</sup>

*PEPFAR funding has been used to procure non-AIDS drugs in all three countries studied—mainly for opportunistic infections—and to purchase laboratory equipment.* Using PEPFAR funds, the Supply Chain Management System has procured drugs for opportunistic infections in Mozambique, Uganda, and Zambia. In Mozambique in 2008 the system plans to procure drugs for sexually transmitted infec-

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65. SCMS 2007.

66. PEPFAR 2007b.

67. PEPFAR 2006b.

68. Cheelo and others forthcoming.

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69. PEPFAR 2007c; The DELIVER Project 2007a.

70. PEPFAR 2006c and Yadav forthcoming.

71. Cheelo and others forthcoming.

tions, a chemotherapy drug (CTX), and more drugs for opportunistic infections. PEPFAR has also significantly invested in the three countries' laboratory capacity. Uganda's Joint Clinical Research Center is an example: PEPFAR funded the establishment of four regional laboratory services centers, building lab extensions, establishing secure drug storage facilities, purchasing equipment, and improving data collection systems.<sup>72</sup>

### **The Global Fund: recipients develop procurement plans, often leading to outsourcing**

*The Global Fund's quality assurance guidelines are consistent with those used by governments selecting antiretrovirals.* To determine if drugs are of sufficient quality to be eligible for purchase, the Fund uses a system that relies largely on the World Health Organization prequalification project list of approved drugs. The governments in all three countries also use the prequalification project.

In addition to the use of the prequalification project, the Global Fund is also willing to fund the purchase of drugs that have been approved by other stringent regulatory authorities, including the U.S. Food and Drug Administration (on which PEPFAR relies for quality assurance).

*Global Fund recipients, in their procurement and supply management plans, can choose any appropriate forecasting method.* Most forecasting is done by the health ministry. Mozambique's central medical stores carry out forecasting for antiretrovirals in their capacity as overseer of the entire health commodities supply chain. In Uganda the health ministry conducts forecasting even though antiretrovirals procurement is outsourced (as discussed below). In Zambia the health ministry conducts forecasting for

its portion of the grant with help from John Snow, Inc.'s USAID | DELIVER project (also discussed below), while the Churches Health Association of Zambia does forecasting for its portion with support from Crown Agents.

*The Global Fund allows both government recipients and nongovernmental recipients to develop procurement plans in accordance with Fund guidelines.* After signing a grant each primary recipient develops a procurement and supply management plan. The Local Fund Agent assesses the plan, which is then reviewed and approved by the Fund secretariat.

A detailed plan for selecting and procuring goods, the procurement and supply management plan requires the primary recipient to list the goods and quantities to be procured together with other information, such as forecasting and inventory management procedures. Although procurement and supply management plans must follow general Fund guidelines, countries have the flexibility to determine their own procedures.<sup>73</sup>

Compared with other donors' procedures (such as the MAP's), Global Fund procedures allow greater scope for recipients—including governments—to use existing procurement systems. For example, Fund procurement in Mozambique is harmonized with health ministry procedures. The Fund's money is contributed to a common fund. Combined with other money from the health sector-wide approach, it is then used to procure commodities.

*Global Fund procurement can be carried out by primary recipients, such as ministries of health, that have robust procurement systems; otherwise the Fund encourages outsourcing.*<sup>74</sup> In its procurement and supply management plan, each Fund primary recipient can choose to manage its own supply chain or to outsource part or all of the job. The Local Fund Agent, who assesses

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72. PEPFAR has also helped the health ministry expand its credit-line system—a system that provides health facilities with virtual credit to purchase commodities of their choosing—to include laboratory equipment (and other essential medical supplies).

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73. For details see the Global Fund Procurement webpage (<http://www.theglobalfund.org/en/about/procurement/>).

74. The Fund's propensity to encourage outsourcing by recipients has been noted by a former Global Fund procurement manager. See Bakker 2007.



plans for technical soundness and feasibility, will determine whether recipients who have proposed managing their own supply chains can effectively handle procurement.

In Uganda, where the health ministry is the primary recipient, the Fund's assessment revealed weaknesses in the ministry's procurement system. So, procurement was outsourced to Crown Agents (and later the World Health Organization). But other parts of the supply chain followed the usual health ministry system: the ministry oversaw forecasting, while the national medical stores managed the storage and distribution of commodities.

In Zambia procurement was initially conducted by a unit in the Central Board of Health—a health ministry division, now dissolved—on behalf of all four primary recipients. But the government systems struggled to complete procurement. The Fund encouraged the Zambian government to outsource the task temporarily to UNICEF while internal systems were strengthened. In addition, it authorized one of the grant's nongovernmental recipients to outsource procurement to Crown Agents.<sup>75</sup>

*Commodities purchased by the Global Fund are stored and distributed through the recipients' procedures; most Fund-financed antiretrovirals are stored in central government warehouses and distributed through antiretroviral-specific channels.* In Mozambique all health ministry antiretrovirals, including those financed by the Fund, are stored in government warehouses. The government then distributes the drugs through a system that differs slightly from that for other health commodities.<sup>76</sup> Antiretrovirals are distributed once a month, traveling by road or air to provincial warehouses where they are then sent on to health facilities around the country. By contrast, most other goods—including essential medicines—are distributed by road on a quarterly basis under a mixed “pull” and “push” sys-

tem.<sup>77</sup> In Uganda the process is similar, except that all antiretrovirals (including those financed by the Fund) are sent from central warehouses in Kampala directly to accredited antiretroviral treatment facilities around the country.<sup>78</sup>

*The Global Fund encourages its recipients to propose activities to strengthen supply chain management systems; Fund support has been used for technical assistance and for training and hiring procurement staff.* The Mozambique government's most recent successful proposal to the Global Fund did not include specific activities to strengthen procurement. But, since in Mozambique Fund money is contributed to a common fund for health, it may be used for systems strengthening as part of overall common fund efforts to bolster the health system.

Uganda's most recent proposal includes plans to use Fund money to support a procurement specialist for two years; afterward the specialist will be integrated into the health ministry in a fulltime position. The proposal also calls for six months of technical assistance for the health ministry procurement unit to improve logistics information management systems.

In Zambia, to improve antiretroviral procurement, the Fund encouraged the health ministry to use Fund resources to hire added procurement staff.<sup>79</sup> (The plan did not work and procurement was later outsourced.) The Fund also expressed its willingness to invest in greater storage capacity for facilities used by the Zambian government and by a nongovernmental primary recipient, the Churches Health Association of Zambia.<sup>80</sup>

### **The MAP: working through governments—with MAP-specific procedures**

*The MAP—like the Global Fund—has guidelines for selecting antiretrovirals that are*

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75. Global Fund 2003a.

76. Antiretrovirals are airlifted monthly to provincial warehouses; other health commodities are distributed monthly by truck to the same warehouses. See Costa and Antunes forthcoming.

77. See note 46 above.

78. Uganda Country Coordinating Mechanism 2007.

79. Global Fund 2003b.

80. Global Fund 2005a, b.

*consistent with those of governments.* The World Bank requires that all drugs purchased with MAP funds be approved by the World Health Organization's prequalification project. The governments of all three countries studied use the same standard, so any antiretrovirals that a government selects can be procured using MAP funds.

*MAP forecasting for pharmaceuticals is carried out by health ministries or central medical stores.* In all three countries studied the MAP relied on existing government procedures at the health ministry or central medical stores to do antiretroviral forecasting and quantification. In Zambia, for example, the central medical stores produced forecasting data and shared it with relevant members of the MAP project management unit at the health ministry.

*The MAP counts on governments to manage project procurement but requires that they do so according to World Bank procedures and guidelines.*<sup>81</sup> Country governments handle procurement at all steps, from bidding to tendering—but they must do so while complying with World Bank guidelines, as stipulated in the grant agreement and project implementation manual. Large procurements must be reviewed and approved by Bank staff on a “no objection” basis (they are approved if the Bank explicitly indicates that it does not object).<sup>82</sup>

Government procurement staff felt that World Bank procurement procedures were generally consistent with those of each government. Still, the process was clearly different. For example, MAP project documents describe the need to train government procurement staff in World Bank procedures. A government official in Mozambique described the unique procedures involved in the World Bank process: “[The World Bank’s] purchasing rules and procedures are different from the governments, they are stricter...

the process is very complex and takes time, it can take three years for one single purchase. Each step requires the verification and authorization of the [Bank].”<sup>83</sup> Similarly, the Project Appraisal Document for Zambia states: “Procurement staffing for line ministries are adequate... however, most of the line ministries have limited or no experience in implementation of Bank financed projects . . . [Therefore], training and capacity building in Bank procurement procedures and guidelines will need to be carried out.”<sup>84</sup>

The MAP-specific procedures have a clear rationale: they are meant to ensure transparency and deter corruption. In Uganda, for instance, a former government official working on the MAP noted that, although government procurement procedures can be “exploited,” still “the kind of review I used to get from the World Bank is not the review I get from my colleagues in government . . . the [Bank] people assess you from A to Z and give points for compliances.”<sup>85</sup>

*High-value procurements for the MAP, including those for antiretrovirals, were carried out in Mozambique through existing health ministry procedures, in Uganda and Zambia by MAP project management units.* MAP procurement can be carried out by various actors receiving MAP funds, including government line ministries. Though the MAP did not procure large quantities of antiretrovirals, high-value procurements—including for antiretrovirals—are carried out by the MAP’s project management units.

Mozambique is an exception. MAP procurement is carried out there through an existing health ministry division, while the health ministry and central medical stores purchase drugs through the common fund for drugs (which combines MAP funds with those of other donors to the health sector-wide approach).<sup>86</sup>

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81. Guidelines include transparency, international bidding, encouraging development of domestic contracting and manufacturing, and so on. See World Bank 2004.

82. The MAP’s procurement guidelines are generally the same as those for other Bank-financed projects.

83. Costa and Antunes forthcoming, p. 102.

84. World Bank 2002, p. 64

85. Ssengooba and Ekirapa forthcoming b.

86. Costa and Antunes forthcoming, p. 110.

Uganda and Zambia are more representative. In Uganda procurement for big-ticket items, such as antiretrovirals, has been carried out by the World Bank's project management unit within the National AIDS Council. In Zambia the finance ministry includes a special project administration unit for the MAP. Both units, while technically sitting within the governments, are often perceived to be separate from them. This point was underscored by a staff member from the project management unit in Uganda: "It was government that was doing the forecasting. The principle under which we were operating was that here in the project unit, we were only coordinators, facilitators, mobilizers."<sup>87</sup>

*The government, through the central medical stores, oversees the storage and distribution of MAP commodities using an antiretroviral-specific distribution system.* The Mozambique government has a specific plan to distribute all antiretrovirals to provincial warehouses each month, and from there to districts and health facilities. MAP-financed products are distributed through the system. Similar processes were reported in Zambia and Uganda.

*Working through governments allows coordination between MAP procurement and procurement by health ministries and external donors.* Since project management unit staff for each MAP project work in governments—typically in the health ministries or on national AIDS councils—they can readily join with government colleagues to coordinate essential functions of the logistics cycle, such as forecasting and commodities selection. In Uganda, for example, the MAP's antiretroviral procurement was closely coordinated with purchases made using Global Fund and PEPFAR funds in an effort to avoid stockouts and duplications (though the effort was not always successful, as shown in box 3.4).<sup>88</sup>

*The MAP's support for systems strengthening has usually comprised building warehouses and training workers—but the long-term benefits from such trainings are limited.* The MAP has funded new warehouse facilities in Mozambique and Uganda, partly because both countries lacked sufficient warehouse space to permit safe storage of purchased commodities. A former MAP official in Uganda explains: "[the government]

87. Ssengooba and Ekirapa forthcoming, p. 40.

88. PEPFAR 2005b, p. 386.

#### Box 3.4 Warehouse capacity overload and drug wastage in Uganda

A large increase in drug procurements funded by international donors has created challenges for Uganda's central medical stores, which have struggled to ensure adequacy in systems, physical storage space, and staff training. The strain on the central medical stores is not caused solely by AIDS donors—but their funding is clearly adding to it. In Uganda's Health Sector Strategic Plan II 2005/06–2009/10 the Ministry of Health stated: "The planning and implementation of parallel procurement effected through donor supported programs and projects remain a critical problem. New initiatives like the Global Fund and PEPFAR are creating an increasingly complex environment for the efficient and effective planning, contracting and management of Essential Medicines and Health Supplies [EMHS] procurement."<sup>1</sup>

The donors have funded activities to help Uganda improve its ability to handle the ever larger quantities of health commodities. PEPFAR, for example, funded a logistics advisor to help redesign the central medical stores' storage and distribution systems. Such efforts are helping, but major problems remain. In March 2008 the Ugandan press reported that more than \$2 million worth of antiretroviral drugs had expired, or was about to expire, while sitting in storage. The central medical stores' general manager responded by telling the parliament that the drug expirations were caused by the challenge of managing procurements made by "third party programmes," including those financed by donors.

#### Note

1. Uganda Ministry of Health 2005, p. 60.

**Source:** Ssengooba and Ekirapa forthcoming b.

didn't have the physical capacity. At one time we brought in 80 million condoms. They were arriving every month, [the government] failed to store them. So, some of the containers would lie there for some time. You see these medical products need sensitive storage and this is an area which needs to be addressed . . . at one time MAP had to come in and hire stores and then later build national medical stores.”<sup>89</sup>

Hiring and training procurement officers were the system strengthening activities most often supported by the MAP. But several informants suggested that such trainings had no lasting impact on government procurement systems—because they focused heavily on World Bank specific procedures, and because of rapid turnover among government procurement staff. As an informant from Mozambique's health ministry explained, “The country is not establishing systems, but training people.”<sup>90</sup> Similarly, a former Uganda MAP official commented: “I think we somehow strengthened the supply chain. But it was temporary. Once the project closed I don't think there was any form of training, infrastructure meant to strengthen the logistics and supply chain systems for the government. There was no specific intervention for that.”<sup>91</sup>

*The MAP has funded purchases of commodities not specific to AIDS.* In all three countries studied MAP funds were used to purchase drugs for opportunistic infections. In Uganda and Zambia MAP money went to other non-AIDS commodities, such as tuberculosis drugs, drugs for sexually transmitted infections, insecticide-treated bed nets, and laboratory equipment.<sup>92</sup>

## Recommendations

This chapter's recommendations focus on how the donors could improve their supply

chain management procedures for antiretroviral drugs. The recommendations in the last chapter of this report will focus on how donors' antiretroviral supply chain systems can make the most of the opportunity to strengthen country essential medicine systems while interacting with them to deliver antiretrovirals.

### All three donors should:

*Establish joint systems to monitor and evaluate antiretroviral supply chains and share lessons widely to benefit other supply chains.* Each of the three donors invests in systems-strengthening activities such as hiring procurement and logistics staff, training health workers to report properly on drug stocks, and adding warehouse space. Yet in each of the three countries studied, weaknesses persist in supply chain management for antiretrovirals. To ensure that their efforts are helping strengthen the antiretroviral supply chain, the donors should work with each government to establish a joint system for monitoring and evaluation. The system would examine the accuracy of forecasts, the frequency of stockouts, the timeliness of reporting through the logistics management information system, and other issues.<sup>93</sup> Through such evaluations the donors could more accurately identify the systems strengthening activities that work best in each context. They should then share what they have learned about systems strengthening as widely as possible, so that other supply chains can benefit from these lessons.

### PEPFAR should:

*Accept the quality standards of the World Health Organization prequalification project in place of the current U.S. Food and Drug Administration standard.* Although PEPFAR has taken some important steps to reduce the complications

89. Ssengooba and Ekirapa forthcoming b, p. 40.

90. Costa and Antunes forthcoming, p. 105.

91. Ssengooba and Ekirapa forthcoming b, p. 41.

92. World Bank MAP Country web pages cited in references titled: “Projects—Uganda”, “Projects—Mozambique”, and “Projects—Zambia”.

93. The donors could adopt, for example, the new core indicators for monitoring and evaluation of procurement and supply management systems that has been developed by the World Health Organization. Donors may also want to use other assessment tools, such as the Logistics Indicator Assessment Tools used by DELIVER. See WHO 2008 and The DELIVER Project 2008.

Table 3.1

**Summary of supply chain systems for essential medicines and for antiretroviral drugs in Mozambique, Uganda, and Zambia**

	<b>Public essential medicines system</b>	<b>Public antiretrovirals system supported by donors</b>	<b>The Global Fund's differences from the public antiretrovirals system</b>	<b>PEPFAR's differences from the public antiretrovirals system</b>	<b>The MAP's differences from the public antiretrovirals system</b>
<b>Selection</b>	The health ministry places medicines on an essential medicines list based on the World Health Organization Essential Medicines List.	A government committee, usually under the health ministry, establishes standard treatment guidelines using the quality standards established by the World Health Organization medicines prequalification project. Antiretrovirals chosen are then typically added to the essential medicines list.	None.	Only funds antiretrovirals that have been approved by the U.S. Food and Drug Administration.	None.
<b>Forecasting and quantification</b>	Entrusted to health ministries or central medical stores.	Varies by country, but generally completed by government with PEPFAR support.	None.	Some PEPFAR recipients do their own forecasting.	None.
<b>Procurement</b>	Entrusted to ministries of health, central medical stores, or both; some procurement is outsourced.	Largely depends on funding source, with most procurement done using Global Fund or PEPFAR resources.	Lets government recipients develop their own procurement plans, but encourages outsourcing where weaknesses exist. In Zambia one nongovernmental recipient does its own procurement.	PEPFAR does procurement on behalf of government; it also funds other recipients that do their own procurement.	Ministry of Health or MAP project units do procurement based on World Bank procedures.
<b>Storage and distribution</b>	Entrusted to central medical stores.	Entrusted to central medical stores. Differences from essential medicines systems differ from country to country.	None—except in Zambia, where one nongovernmental recipient does its own storage and distribution (in coordination with the government).	Most drugs are stored and distributed by central medical stores—but some PEPFAR recipients do their own storage and distribution (especially in Uganda).	None.
<b>Logistics management information system</b>	Overseen by central medical stores; generally considered weak.	Antiretroviral-specific in Zambia and Uganda; integrated into essential medicines system in Mozambique.	None.	Supported development of systems in Uganda and Zambia. Some PEPFAR recipients use their own logistics management information systems.	None.

Source: Authors' analysis of data as described in text.

posed by using a different quality standard from the host country governments and other donors, the requirement that PEPFAR-funded drugs be approved by the U.S. Food and Drug Administration adds unneeded complexity to the procurement process for antiretroviral drugs. PEPFAR should remove this requirement and replace it with a new policy that would accept the quality standards of the World Health Organization prequalification project.<sup>94</sup>

94. The challenges presented by the U.S. Food and Drug Administration requirement and the recommendation to remove this requirement have been described in several other reports. See, for example, IOM 2007.

### The Global Fund should:

*Encourage primary recipients to address weaknesses in procurement and supply management assessment by the start of Phase 2.* Nothing is inherently wrong with outsourcing supply chain management. But some Global Fund primary recipients who have proposed managing their own supply chains—such as in Zambia—could not do so because of weak systems. The Fund should actively encourage such primary recipients to make whatever investments are needed—for technical assistance, for installing new management systems, or for additional staff hires—to take on supply chain management functions by the beginning of the grant's third year (Phase 2 in the Fund's grant process).

**The MAP should:**

*Increase efforts to conduct procurement through health ministry procurement units.* In both Uganda and Zambia the MAP has procured health goods through its own project management unit in the government. The governments' health ministries have thus missed the opportunity to benefit from the experience of procuring for MAP projects. Since the MAP tends to rely on governments to conduct procurement, it

should make every effort to procure commodities through standard health ministry procurement units, providing long-term benefits to public procurement systems for health goods. Where the World Bank believes that health ministry units cannot conduct MAP procurement, it could invest in systems strengthening during a MAP project's early years, with the ultimate goal of transferring procurement responsibilities to the health ministry.

# 4 Human resources for health

Most countries in sub-Saharan Africa suffer from major problems with the availability—and the equitable distribution—of qualified clinical and technical health workers and managers. Shortages exist in all clinical cadres, including doctors, nurses, managers, and administrators, with the crisis at its worst in rural areas. More technical staff are needed for procurement, for financial management, and for monitoring and evaluation. The scarcity of qualified health workers stems from several factors, such as insufficient funds, poor job conditions, and a lack of qualified candidates.<sup>95</sup>

The three donors should be concerned about the effects of their activities on the health workforce in sub-Saharan Africa—for two closely related reasons:

- First, the health worker crisis is arguably the greatest obstacle to improving people's health in Africa.
- Second, AIDS programs are largely implemented through country health systems, so

the staff crisis is a major barrier to scaling up HIV/AIDS programs in many of the most severely affected countries.

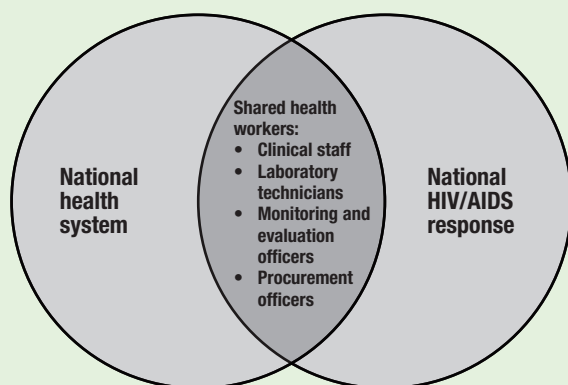
Although not all HIV/AIDS programs are implemented by health professionals, many are—particularly treatment programs. The donors' human resource practices can thus exert a profound effect on the health workforce in the countries where they operate. The reliance of national health systems and HIV/AIDS responses on many of the same health workers is pictured in figure 4.1.

Each of the three donors gives very little of its total budget to support new health worker training, while devoting more support to the in-service training of existing health workers to provide HIV/AIDS services. (For a summary of donor policies on human resources for health in the three countries studied, see table 4.1 at the end of this chapter.)

In contrast, health staffing for each country's public sector is affected differently by the different policies of the three donors. Although the Global Fund's policies and practices vary from country to country, no Fund money has been used to hire new public health workers in any of the three countries studied. PEPFAR's hiring practices and salary supplements, or "top-ups," for AIDS activities appear to pull health staff out of each country's

95. For a review of the dimensions of the African health worker crisis, see Huddart and Picazzo 2003; Levine and Vujicic 2007; Moore and Morrison 2007.

Figure 4.1 HIV/AIDS programs use many of the same health workers as each country's broader health system



Source: Authors' construction.

public sector and into PEPFAR-funded programs, where they focus largely on AIDS—not on broader health services. But the MAP provides some support for hiring and paying public health staff in ways that differ from country to country.

### **PEPFAR: hiring practices and salary supplements may be pulling health workers from general health to HIV/AIDS services**

*PEPFAR has provided limited support for training new health workers.*<sup>96</sup> In Mozambique PEPFAR allocated \$1.6 million to fellowships for training various health worker cadres. PEPFAR also funded efforts to improve preservice training facilities and curriculums. Such investments, however, constitute only a very small share of PEPFAR funds for Mozambique (which totaled \$228 million in 2008).

In Uganda PEPFAR provided no money at all to education institutions for training new health workers. In Zambia PEPFAR is providing modest support (\$1.3 million) to a national strategy on human resources for health, including both preservice and in-service training, retention programs, and strengthening information systems.<sup>97</sup> PEPFAR has also granted \$100,000 to the Master in Public Health program at the University of Zambia School of Medicine. Again, though, such investments are minor compared with total PEPFAR funds for Zambia (\$262 million in 2008). Moreover, PEPFAR funding for preservice training has focused largely on designing HIV/AIDS curricula and integrating them into training programs—not on general support to train new health workers.

*PEPFAR policies on preservice training are evolving.* Through 2007, PEPFAR country teams were limited to spending \$1 million on preservice training. In 2008 this was raised to

\$3 million, and in 2009 it will rise to \$6 million or 3% of the country budget, whichever is less.<sup>98</sup>

*PEPFAR provides significant funds for in-service training of health workers—training that is usually focused on HIV/AIDS activities, especially antiretroviral treatment.* In Mozambique PEPFAR has financed both antiretroviral treatment and opportunistic infection training courses for midlevel clinical officers. In Uganda laboratory staff have been trained in HIV testing and in using new equipment and information systems. Such training is almost always focused specifically on scaling up HIV/AIDS interventions, and often on providing antiretrovirals.

*PEPFAR funds the hiring of new public-sector technical staff in all three countries studied—but it funds the hiring of new public-sector clinical staff only in Mozambique.* In Mozambique PEPFAR has funded 17 technical advisor hires at health ministry headquarters and has funded more such hires in the provinces—for areas including logistics, laboratory services, monitoring and evaluation, supply chain management, antiretroviral treatment, pediatric AIDS treatment, and preventing mother-to-child transmission. PEPFAR also funds the hiring of clinical staff in public facilities. The clinical staff are paid according to health ministry guidelines and salary scales. In contrast, the technical advisors hired to support the ministry are paid higher salaries outside the government salary structure.

In Uganda and Zambia PEPFAR has hired technical staff (such as procurement staff) in the health ministry. PEPFAR has not hired public clinical staff in Uganda or in Zambia.

*PEPFAR has offered clinical workers salary supplements, or “top-ups,” to compensate for the extra work of administering PEPFAR-funded programs—in some cases reducing attention to other health services.* PEPFAR has supported top-ups in all three countries studied.

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96. PEPFAR 2007c.

97. These funds from the U.S. Agency for International Development are channeled through the Health Systems Strengthening Program, an Abt Associates project.

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98. Correspondence with staff from the Office of the U.S. Global AIDS Coordinator.



In Mozambique, however, it has discontinued them. In Zambia—where public facility health workers who administer PEPFAR-funded anti-retroviral treatment are paid about \$9–11 more for a shift—the top-ups have overworked staff, while limiting their ability to provide other health services.<sup>99</sup> Uganda’s government has recently asked PEPFAR to discontinue top-ups because of this issue.

In August 2006 the Office of the Global AIDS Coordinator instructed PEPFAR country teams to phase out top-ups for public sector staff by July 2007. Researchers in Uganda and Zambia were unable to confirm whether this policy has been fully put into practice.

*PEPFAR funds a substantial number of nongovernmental health worker and manager hires—many at much higher salaries than those paid by the civil service.* Media reports in Uganda show that most health job advertisements contain a PEPFAR or U.S. Agency for International Development logo, and that most of the jobs are for HIV-related administration, information processing, and project monitoring. PEPFAR supports the salaries of nearly all of the several thousand staff at The AIDS Support Organization (TASO), for example. In Zambia—where PEPFAR-supported programs also advertise heavily in newspapers—PEPFAR-funded nongovernmental organizations pay a data clerk about twice what a registered nurse would make in the public sector. Significant salary differentials also exist between public sector staff and staff in nongovernmental organizations supported by PEPFAR funding.

*Better pay and incentives are pulling health staff away from the public health sector and into PEPFAR-funded HIV/AIDS programs.* PEPFAR does not plan to draw staff away from the public sector, where poor pay and incentives are the main reason for staff departures. Yet PEPFAR hiring in all three countries studied has tended to attract more and more health workers and managers out of the public sector and into PEPFAR-funded nongovernmental HIV/AIDS programs. In Uganda, for example, a majority of the graduates

of a fellowship program at Makerere University left their government positions after the program to take up posts with programs funded by the U.S. Centers for Disease Control.

Although health worker mobility is not inherently harmful—and can be beneficial—it is harmful when too few health staff are trained. The competition for qualified staff that results benefits PEPFAR-funded HIV/AIDS programs, but it does so at the expense of general public health care provision.<sup>100</sup>

### **The Global Fund: human resource policies and activities vary from country to country**

*The Global Fund funds new health worker training in Mozambique, but not in Uganda or Zambia.*<sup>101</sup> The Global Fund contributes to Mozambique’s health sector common fund, PROSAUDE, which funds preservice training for health staff at education institutions. Mozambique’s Round 6 grant specifically included funding for preservice training of 510 basic-level and 11 middle-level health workers. No Fund money supports the training of new health workers in Uganda or Zambia.

*Global Fund grants support in-service training in all three countries.* The total amount and exact nature of such funds could not be determined because the information is not publicly available and could not be obtained from key informants. In Zambia the Fund has provided a small amount of money (\$76,000) to a health ministry HIV/AIDS workplace program.

*Although there is no explicit policy against it, the Global Fund does not support hiring new*

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100. PEPFAR supports task-shifting as an important way to immediately address the health worker shortage. Task-shifting takes lower skilled workers and trains them to perform tasks that higher-level health staff would normally perform, freeing up more highly trained staff to attend to the more complex activities. This strategy will be investigated in further detail in a forthcoming report.

101. For a good review of the types of activities that applicants have applied for, and that the Global Fund’s Technical Review Panel has approved, see Dräger and others 2006.

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99. CHESSORE 2007.

*public-sector health workers in any of the three countries studied.*<sup>102</sup> No new public staff were hired with Fund money in Mozambique or Zambia. In Uganda the Fund limited new staff recruitment to the office established for administering the grant—with strict guidelines to use existing staff and not to offer new salaries.<sup>103</sup>

*Salary top-ups or allowances have been provided with Global Fund money in Mozambique and Uganda—possibly directing staff attention toward Fund programs at the expense of other health programs.* The Global Fund's contributions to Mozambique's provincial health common fund support subsidies to specialized doctors, giving them incentives to serve in provinces where they are most needed. Through PROSAUDE the Fund also supports salary subsidies for department heads, national deputy directors, national directors, and a permanent secretary at the health ministry headquarters. Similarly, in Uganda the Fund supports allowances to district health officers for taking on the extra work of managing Fund grants. Such allowances can lead officers to focus on Fund programs at the expense of other health programs.

*Hiring nongovernmental staff for Global Fund programs is done differently in each country.* Global Fund programs in Zambia use different hiring procedures from those of the civil service, offering higher salaries and drawing health workers from public health facilities to nongovernmental HIV/AIDS programs. Fund programs in Mozambique have a two-part system based on government regulations. On the one hand, nongovernmental organizations operating wholly separately from the public health system can pay staff any amount—usually much more than the public sector. On the other hand,

when nongovernmental organization staff work in the public health system they must be paid according to government pay scales (required by a memorandum of understanding between the government and nongovernmental organizations). So, when the government contracts with nongovernmental organizations using PROSAUDE funds—to which the Global Fund contributes—it offers government pay scales. Whether this rule is enforced consistently is not clear. In Uganda the Global Fund does not fund new nongovernmental staff hires.

### **The MAP: providing limited support for the public sector workforce**

*The MAP funds preservice training for new health workers in Mozambique—not in Uganda or Zambia.* In Mozambique the MAP has given considerable support to both in-service and preservice training (though World Bank staff did not release figures). Because the MAP has now begun contributing to Mozambique's health sector common fund, it is not possible to track all MAP money—but the MAP generally supports all of the common fund's human resource spending.

In contrast, in Uganda and Zambia the MAP does not support preservice training for new health workers.

*The MAP supports in-service training in all three countries studied—usually for HIV/AIDS services, but at times for broader health services.* In Uganda the MAP has financed short-term training for HIV counselors, home-based care delivery, antiretroviral management, monitoring and evaluation, and strategic planning. Although the training is focused largely on HIV/AIDS activities, the skills gained by HIV focal persons and staff in newly formed community-based organizations can be applied in other health sectors.

*Though the MAP has various policies for funding new public-sector health staff hires in different countries, it mostly hires technical—not clinical—staff.* In Mozambique MAP money was once used to pay existing staff salaries in the health ministry's investment management unit. In 2004 the health minister changed

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102. While the Global Fund does not have an explicit policy on financing the hire of public sector clinical staff, conversations with staff suggest that the Fund prefers not to do so.

103. Uganda's Round 7 grant provides for the hiring of technical monitoring and evaluation and procurement staff in the Ministry of Health and Uganda AIDS Commission. The grant was only recently signed, and at the time of writing, the authors of this report found no evidence that the hires had taken place.

**Table 4.1 Summary of donor policies on human resources for health in Mozambique, Uganda, and Zambia**

	PEPFAR	Global Fund	The MAP
Does the donor support preservice training for new health workers?	In Mozambique and Zambia only.	In Mozambique only.	In Mozambique only.
Does the donor support in-service training?	Yes.	Yes.	Yes.
Does the donor support hiring new public sector staff?	Yes.	No.	In Mozambique and Zambia only (mainly technical rather than clinical staff).
Does the donor provide top-ups?	Yes (but it has now discontinued them in Mozambique).	In Mozambique and Uganda only.	No.
Does the donor support hiring nongovernmental health workers?	Yes.	Yes.	In Mozambique and Zambia only (but on a fairly small scale).

Source: Authors' analysis of data as described in text.

that policy, and now the MAP generally does not fund salaries for existing staff. But it does fund the hiring of new staff in Mozambique—such as for long-term technical assistance at the national AIDS council, CNCS. In addition, MAP money channeled to the CNCS common fund can be used to hire new staff.

In Uganda the MAP's policy generally does not allow for hiring or paying new public health staff, except in rare circumstances when such hires are crucial to a project's success (such as hiring a monitoring and evaluation advisor to the Uganda AIDS Commission).

Zambia's MAP project does not put much of a burden on the public sector because its program is implemented largely by community-based groups. Yet the MAP does fund salaries for public sector health workers in Zambia. Such MAP-funded positions are paid on a World Bank scale, which is higher than government civil service pay (and varies for local and international workers). To avoid hiring staff away from the health ministry, Bank policy prohibits the MAP from hiring staff employed by the government in the past two years.

*The MAP rarely funds salary top-ups.* Researchers found no evidence that the MAP has funded salary top-ups in Mozambique or Zambia. In Uganda, however, the MAP has funded top-ups for district officials to compensate them for the extra burden of managing MAP funds in their districts.

*MAP money is generally not used to hire nongovernmental health workers.* As with the public sector, the MAP in Uganda does not hire or fund salaries for nongovernmental health workers. In Zambia most MAP funds go to community initiatives through the Community Response to HIV/AIDS (CRAIDS), so MAP programs do not generally rely on trained health workers and do not play a large role in hiring new health staff.

In Mozambique MAP money is subgranted to subrecipients by the government, so any hiring of nongovernmental health workers using MAP funds must use government pay scales (in accordance with the memorandum of understanding between the government and civil society mentioned above).

# 5 Moving forward: the opportunity to strengthen health systems while expanding AIDS programs

The three donors have predictably focused on AIDS programs in their efforts to improve country health information systems, supply chain management, and human resources. They have supported antiretroviral-specific logistics systems and AIDS-specific reporting systems, and they have trained and paid health workers to provide AIDS services. And—although each donor’s approach is unique—all three donors have helped establish AIDS-specific systems and processes at the operational level that are distinct from those used for other health programs.

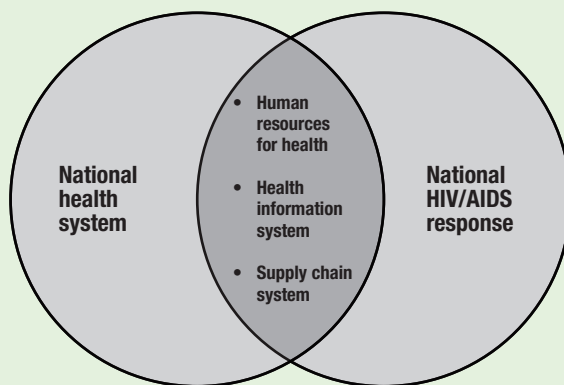
These AIDS-specific processes for human resources, health information, and supply chains use many of the same resources as the broader health system (figure 5.1), including qualified clinical and technical workers and the health infrastructure. For example, reports to AIDS donors and reports for the health information system are often completed separately by the same health facility staff. Antiretrovirals and essential medicines are stored, delivered, and monitored primarily by the central

medical stores. And health workers being trained to administer AIDS programs must also perform a broad range of other health services.

Given the emergency conditions prompting the initial global response to AIDS, it is not surprising that donors chose to circumvent existing but weak components of national health systems to set up systems devoted to achieving immediate and demonstrable results for AIDS programs. Given the desire to rapidly expand antiretroviral treatment, voluntary counseling and testing, and other HIV/AIDS interventions in the face of poor data, weak supply chains, and human resource constraints, AIDS donors chose—some more purposefully than others—to set up separate systems to rapidly achieve their programmatic goals.

Several years into the global response to AIDS, the three donors now face a challenge. As they continue to increase AIDS funding and expand their programs, they will require greater shares of the resources in each country’s health system. The catch is that by using existing health systems to expand AIDS programs, without making a concerted effort to strengthen these already weak systems, donors are likely to strain them.

Figure 5.1 **Parts of donor-supported national AIDS responses that share resources with larger country health systems**



Source: Authors' construction.

## Recommendations to the donors to seize the present opportunity

Because stronger and robust health systems are essential to ensure a long-term, expanded AIDS response, the three donors should take decisive steps to benefit both AIDS programs and larger country health systems. Certainly, global AIDS financing cannot be held solely responsible for fixing these systems. Many other stakeholders have important roles to play—especially the governments, which must lead by making strong commitments to improve health systems. But the donors can, and should, take advantage of opportunities to strengthen health systems while implementing and expanding their AIDS programs. In particular, we recommend that the donors take several actions.

### To improve health information systems, the donors should:

*Coordinate government and donor information needs and flows through national health management information systems and other systems—to reduce information system fragmentation, to minimize duplicative and burdensome reporting, and to improve data quality.* Donor-specific reporting systems have added complexity to the information flows for AIDS and health in all three countries. In the short term donors can help to manage the added complications by working with each government to collectively map all information needs—theirs and the government's—against country information system capacity. With such a map, the donors and the government could coordinate data collection to minimize duplication and enable the donors to provide support—finances, human resources, and information technology—as needed.

In the long term the donors should work to eliminate their donor-specific AIDS systems, because such systems increase the burden of reporting for scarce health sector staff. That cannot be done, however, without first strengthening the health information systems in all three countries. Efforts to strengthen the systems will vary depending on circumstances in each country. In Mozambique, for example, a key

problem is that much of the monitoring and evaluation system exists on paper only. Staff at donors and national institutions spend a great deal of time writing plans, reviews (with many challenges and recommendations), and designing and publishing theoretical monitoring and evaluation systems. For all that, the roles of the national and international actors—their responsibilities to put such plans, recommendations, and monitoring and evaluation systems into practice—is never clearly defined.<sup>104</sup> The national AIDS council, Ministry of Health, donors, and other stakeholders need to commit to ensuring that the plans are put into operation, giving them high priority within the national response.

*With governments and other stakeholders, jointly design and invest in information technology solutions for data capture, management and analysis in health ministries, districts, and facilities.*

Information technology spending by all three donors has not been widespread enough to reduce the fragmentation of AIDS information flows, nor have they been consistently provided in the three countries studied. For example, in Zambia the SMARTCare System has not been well integrated into the health management information system for all patients as planned, and exclusively focuses on AIDS patients.

*Capture investments and their results in building information systems management capacity more systematically.* All three donors are providing specific inputs—finances, human resources, training—to increase the capacity of government and other stakeholders to manage health information system, but none has captured those inputs systematically. More important, the donors have not measured the results of their investments so that they can expand activities that are working well and adjust activities that are not.

*Create data collection and reporting incentives through information feedback systems.* By sharing the results—including program and financial

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104. Costa and Antunes forthcoming.

measures—with health managers and workers, donors can make the information usable by those who collect it, leading them to value it more and driving them to collect higher-quality data. For example, monitoring data reported to MEEPP in Uganda could be shared with health managers at all levels—community, district, and province—to let them monitor their own progress on an ongoing basis, in addition to collecting and reporting data for monitoring the response at higher levels.

**To improve supply chain systems, the donors should:**

*Pursue strategies that will let antiretroviral drugs and essential medicines be distributed jointly and be managed using the same logistics management information system.*<sup>105</sup> In all three countries studied, once procurement is completed, essential medicines and antiretroviral drugs follow paths with clear similarities. Often they use the same resources, including storage space, distribution systems, staff time, and information systems.<sup>106</sup> Despite these similarities, the three global AIDS donors have decided for several reasons—including weaknesses in existing health drug distribution systems and the critical importance of avoiding antiretroviral stockouts—to largely support procedures for antiretrovirals that are separate from those for essential medicines. Though the approach has merit, it places heavy demands on resources used for both antiretrovirals and essential medicines. And as antiretrovirals come to be offered at more and more facilities, maintaining the separate systems will become increasingly complex.

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105. Merging supply chains need not imply that one system (such as that for antiretrovirals) begins to use the other system (such as that for essential medicines). It can also mean that a new system is established to accommodate multiple past systems (such as for antiretrovirals, essential medicines, or others). Supply chains can be integrated in a variety of ways. In addition to full integration, other options include integrating one or more specific functions, such as distribution or logistics information management.

106. Although procurement is also similar for both types of drugs, many different actors—including governments, donors and procurement agents—are now engaged in procurement and they tend to use different resources.

Through their support for antiretrovirals, the donors and governments have demonstrated that—with strong commitment and sufficient financing—well functioning storage, distribution, and logistics management procedures can be established. There has also been some movement toward merging the systems for antiretrovirals and essential medicines. In Mozambique, for example, the donors have partially integrated antiretroviral procedures into the broader systems for essential medicines; in Zambia distribution of both goods occurs on the same trucks; in Uganda efforts are underway to develop a logistics management information software package to accommodate all health goods, including antiretrovirals. The donors should thus explore, country by country, the prospects for using common systems for storage, distribution, and logistics information management. Such common systems could be created in several ways:

- By integrating one of the systems into the other, after making needed improvements to the system that will be retained.
- By establishing new systems to accommodate both antiretrovirals and essential medicines.
- By outsourcing storage, distribution, and logistics information management to the private sector.

Regardless of which approach the donors choose, this process is likely to be a long-term, incremental endeavor—but one that will yield significant benefits for both antiretrovirals and essential medicines.

**To strengthen human resources for health, the donors should:**

*Provide more support to train new health workers.* Training new health workers (preservice training) is an important way to address the human resource crisis in African health systems—yet the donors have funded very little of it.<sup>107</sup> Each donor should provide significant support to local education institutions to train more health staff, both clinical and technical, to support an expansion of HIV/AIDS programs while other health services are maintained or expanded.

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107. See, for example, Huddart and Picazzo 2003.

*Give priority to financing for new health worker hires—as opposed to top-ups for current health workers.* Although top-ups for AIDS-related tasks compensate public-sector health staff for the added work of implementing donor-funded HIV/AIDS programs, they also tend to focus an already overburdened workforce on AIDS services at the expense of other important health programs. A better way to address staff constraints for donor-funded AIDS programs is to finance new hires, in both the public and nongovernmental sectors, to absorb the added workload. Such hires would, of course, require a supply of qualified workers. And that underscores the need to train new health workers (as recommended above).

If top-ups must be used, donors should consider supplementing workers for all the hours they work—not just for the hours they spend on AIDS tasks. That would compensate staff for the increased workload, yet ensure they do not give HIV/AIDS services priority at the expense of other important health services.

*Work with governments to improve public-sector human resource policies.* Much of the human resource crisis in African health systems is due to low salaries, poor incentives, and rigid human resource policies that fail to reward good job performance.<sup>108</sup> Donors should work with governments on medium- to long-term strategies to increase health worker pay, to create incentives for better performance, and to make hiring, promotions, and salaries more flexible. That would encourage more qualified workers to enter and stay in the public health workforce, while also motivating current health workers.

### **Governments, too, must take action to seize the present opportunity**

As this report has emphasized, global AIDS donors play a critical role in ensuring that AIDS program expansion will benefit national health systems. But country governments also have an important role to play.

108. See Huddart and Picazo 2003 for a review of Africa's crisis in human resources for health crisis.

Each government can lead in developing clear plans and priorities for using external health aid, encouraging donors to invest in the broader health system. For example, Mozambique's government urged donors to fund the health sector as a whole rather than for particular diseases. The donors responded by integrating the antiretroviral logistics management information system into broader systems for essential medicines. They invested in preservice training for new health workers. And they integrated their health information systems into the government's health management information system.<sup>109</sup>

In addition to exercising leadership, governments can create more incentives for donors to integrate their programs into existing health systems. They can, for instance, act on their commitments to strengthen components of the health systems—information systems, supply chains, and others—that donors initially avoided using because of their weaknesses.<sup>110</sup>

### **Further research on the effects of AIDS funding on health systems is needed**

Further research is needed to disentangle the effects of AIDS programs on health systems. A case in point: we have identified ways that donor programs are fragmenting systems for supply chain management and information gathering. But is fragmentation good or bad? Does it

109. Government leadership is just one of many factors needed to ensure that donors are supporting national health systems. Zambia's government, despite demonstrating leadership, has had less success than Mozambique's in persuading donors to invest in health systems. Some have suggested that Mozambique's success results partly from donors' special interest in supporting the government and its priorities after the end of the civil war in 1994. It should also be noted that, though Mozambique's model is promising, significant weaknesses persist in its health system generally, and specifically in its sector-wide approach (see Costa and Antunes forthcoming).

110. One such commitment—already made by all members of the African Union through a pledge, but not yet met by any African country—is to allocate at least 15% of annual budgets to the health sector. For details see the Abuja Declaration of 2001 (online at [http://www.un.org/ga/aids/pdf/abuja\\_declaration.pdf](http://www.un.org/ga/aids/pdf/abuja_declaration.pdf)).

lead to more focused systems, with clear lines of accountability and opportunities for cross-learning? Or does it create inefficiencies by duplicating efforts and making coordination more difficult? Establishing, say, AIDS-specific stocking systems might add to the workload of already overburdened pharmacists—but it might also provide cross-learning opportunities, helping to improve stock management systems for other medicines.

Similarly, we have also described the role of top-ups in AIDS programs. Are top-ups having positive or negative effects on health worker shortages? Certainly in the short term they can motivate health staff to focus on AIDS at the expense of other services—but in the medium term they might also attract more workers to the health facilities where top-ups are provided.

Again, are AIDS-specific monitoring and evaluation programs, such as Uganda's

Monitoring and Evaluation of Emergency Plan Progress (MEEPP), improving data management in countries? Are all the lessons learned from participating in HIV/AIDS information systems specific to AIDS, or are some transferable to broader health information systems?

As the PEPFAR, the Global Fund, and the MAP increase funding for HIV/AIDS, the donors will continue to find that country health system weaknesses create barriers to program expansion. To surmount those barriers they should finance programs in ways that create the most positive spillovers to broader country health systems while doing the least harm to those systems. Since earmarked funding for HIV/AIDS is evidently here to stay, such an approach will ensure that donor funds bring the greatest possible benefits to country health systems while achieving desired AIDS-specific outcomes.



## Study methodology

This annex explains why Mozambique, Uganda, and Zambia were selected for the study that produced this report. It then describes how research partners in the three countries collected information by reviewing policy and program documents and interviewing officials from the donor agencies, governments, and funding recipients, as well as other stakeholders. A final section points to the study's limitations.

### Host country selection

Mozambique, Uganda, and Zambia were selected for this report because:

- They vary in their size, their HIV prevalence, their development indicators, the stage to which the epidemic has evolved in each country, the nature and strength of the government response, and the nature and strength of donor involvement.
- Despite these differences, the common location of all three countries in sub-Saharan Africa makes it possible to compare them in enlightening ways.

To study the interactions of three major global AIDS donors with the national health systems in these three countries is to see how their policies are implemented on the ground, in countries with different epidemics and with different economic and political contexts.

Although three countries is too small a sample to support broader inferences, looking at the donors' practices in countries that differ from one another in important ways can point to underlying patterns of donor behavior.

### Country-level research

In-country research for this report was conducted by local partners in each country, including Austral-COWI Consulting in Mozambique, the Department of Health Policy

Planning and Management at the Makerere University School of Public Health in Uganda, and the Health Economics Programme at the Economics Department of the University of Zambia. Field research was coordinated by a field director based in Nairobi, Kenya, and the overall effort was managed and coordinated by the HIV/AIDS Monitor team at the Center for Global Development in Washington, D.C.

Data collection included a desk review of donor documents and interviews with donor officials, government officials, funding recipients, and other stakeholders in each country using purposive sampling. Key informants were selected for their specific knowledge about donor interactions with health systems in all three countries, particularly the three components that this report examines: the health information system, the supply chain system for drugs and health commodities, and the human resource system for health. Information was validated by triangulating data from several key informant interviews and evidence from available documents.

To ensure accuracy, a draft of this report was reviewed by technical experts and by well informed people at each donor organization.

### Study limitations

The authors selected Mozambique, Uganda, and Zambia for this study hoping to illuminate

how donor practices vary with country contexts. One limitation of such a selection is that the way each donor's programs are being implemented in three countries might not be indicative of that donor's practices elsewhere in Africa. However, lessons learned from this comparative analysis can be applied broadly to other African countries with characteristics similar to those of one or more countries highlighted here.

In some cases researchers received conflicting reports about donor activities from different

key informants. To ensure validity the authors attempted to reconcile the information with experts and with the donors.

The researchers had only a limited ability to uncover the effects of particular donor policies. Although some particular effects were revealed, the report in general has confined itself to describing the interactions of donor programs with national health systems and to discussing some possible implications of those interactions.

## References

- AMREF (African Medical and Research Foundation). 2004. *Tracking Human Resources and Wage Bill Management in the Health Sector*. Kampala, Uganda: Commissioned by the Uganda Ministry of Health.
- Aronovich, D. G., and S. Kinzett. 2001. *Kenya: Assessment of the Health Commodity Supply Chains and the Role of KEMSA*. Arlington, Va.: DELIVER/John Snow, Inc., for the U.S. Agency for International Development.
- Bakker, G. 2007. *A Weak Link in the Chain*. Washington, DC: Global AIDS Alliance.
- Banda, M., E. Ombaka, S. Logez, and M. Everard. 2007. *Multi-Country Study of Medicine Supply and Distribution Activities of Faith-Based Organizations in Sub-Saharan African Countries*. Geneva: World Health Organization.
- Briggs, C. J., and P. Garner. 2006. "Strategies for Integrating Primary Health Services in Middle- and Low-Income Countries at the Point of Service Delivery." *Cochrane Database of Systematic Reviews* (2).
- British Medical Journal*. 2007. *British Medical Journal*, 334(February). London.
- Business Synergies. 2002. *Drug Tracking Study—Final Report*. Kampala, Uganda: Commissioned by the Uganda Ministry of Health.
- Cheelo, C., S. Mwamba, B. Chitah, and L. Ingombe. Forthcoming. *Donor Effects on the National AIDS Response and the National Health System in Zambia*. Lusaka, Zambia: University of Zambia, Department of Economics.
- CHESSORE (Centre for Health Science and Social Research). 2007. "Human Resource for Delivery of Health Services in Zambia: External Influences and Domestic Policies and Practices." Lusaka, Zambia.
- Costa, D., and E. Antunes. Forthcoming. *Donor Effects on the National AIDS Response and the National Health System in Mozambique*. Maputo, Mozambique: Austral-COWI Consultoria.
- The DELIVER project. 2006a. *Building Blocks for Inventory Management of HIV Tests and ARV Drugs*. Arlington, Va.
- . 2006b. *Scaling up Logistics Management Information Systems in Health Commodity Supply Chains*. Boston, Mass.: John Snow, Inc.
- . 2006c. *Managing Zambia's National ART Supply Chain Demands Attention and Collaboration between National Supply Chain Partners*. Durban, South Africa. [<http://deliver.jsi.com/dhome/topics/health/hiv/hcresources/hcpresentations>]
- . 2006d. *Procurement Strategies for Health Commodities: An Examination of Options and Mechanisms within the Commodity Security Context*. Arlington, Va.
- . 2007a. *Zambia: Final Country Report*. Arlington, Va.
- . 2007b. *Uganda: Final Country Report*. Arlington, Va.
- . 2007c. *Mozambique: Final Country Report*. Arlington, Va.
- . 2008. *Logistics Indicators Assessment Tool (LIAT)*. Arlington, Va.: United States Agency for International Development | DELIVER PROJECT, Task Order 1.
- Dräger, S, G. Gedik, and M. R. Dal Poz. 2006. "Health Workforce Issues and the Global Fund to Fight AIDS, Tuberculosis and Malaria: An Analytical Review." *Human Resources for Health* 4.23.
- The Global Fund. 2003a. "Grant Scorecard for Round 1 Grant to Churches Health Association of Zambia." Geneva. [[http://www.theglobalfund.org/search/docs/1ZAMH\\_577\\_79\\_gsc.pdf](http://www.theglobalfund.org/search/docs/1ZAMH_577_79_gsc.pdf)]

- . 2003b. “Grant Scorecard for Round 1 Grant to Central Board of Health in Zambia.” Geneva. [[http://www.theglobalfund.org/search/docs/1ZAMH\\_577\\_76\\_gsc.pdf](http://www.theglobalfund.org/search/docs/1ZAMH_577_76_gsc.pdf)]
- . 2005a. “Grant Scorecard for Round 4 Grant to Ministry of Health of the Republic of Zambia.” Geneva, The Global Fund. [[http://www.theglobalfund.org/search/docs/4ZAMH\\_831\\_411\\_gsc.pdf](http://www.theglobalfund.org/search/docs/4ZAMH_831_411_gsc.pdf)]
- . 2005b. “Grant Scorecard for Round 4 Grant to Churches Health Association of Zambia.” Geneva, The Global Fund. [[http://www.theglobalfund.org/search/docs/4ZAMH\\_831\\_412\\_gsc.pdf](http://www.theglobalfund.org/search/docs/4ZAMH_831_412_gsc.pdf)]
- Hogle, J., ed. 2002. *What Happened in Uganda? Declining HIV Prevalence, Behavior Change, and the National Response*. Washington, DC: U.S. Agency for International Development.
- Horizons International Limited. 2001. *Tracking Study for Primary Health Care (PHC) Conditional Grants 1999/2000 and 2000/2001*. Kampala, Uganda: Commissioned by the Uganda Ministry of Health.
- Huddart, J., and O. Picazzo. 2003. “The Health Sector Human Resource Crisis in Africa.” An Issues Paper. Academy for Educational Development SARA Project / U.S. Agency for International Development, Washington, D.C.
- IOM (Institute of Medicine). 2007. *PEPFAR Implementation: Progress and Promise*. Washington, DC: The National Academies Press.
- Keddem, C., Y. Chandani, J. Bates, S. Andersson, C. Allers, and E. Takang. 2008. *Managing HIV and AIDS Commodities through Integrated Supply Chains*. Arlington, Va.: USAID | The DELIVER project.
- Kifuko-Malinga, B. 2003. *Mid-Term Review Report: The National Strategic Framework for HIV/AIDS Activities in Uganda: 2000/1—2005/6*. Kampala, Uganda: Uganda AIDS Commission.
- Kintu, P., E. Ekochu, D. Businge, and S. Kironde. 2006. *UPHOLD LQAS Survey Report 2006: Household and Facility Survey on HIV/AIDS, Health and Education Interventions in 34 Ugandan Districts*. Kampala, Uganda: Uganda Program for Human and Holistic Development.
- Levine, R., and M. Vujicic. 2007. “A Labour Market View of the African Health Worker Shortage: Policy Issues.” Background paper. Global Health Workforce Alliance Task Force for Scaling up Education and Training for Health Workers, Washington, D.C.
- Martinez, J. 2006. *Implementing a Sector Wide Approach in Health: the Case of Mozambique*. London: HLSP Institute.
- Mills, A. 2005. “Mass Campaigns versus General Health Services: What Have We Learnt in 40 Years about Vertical versus Horizontal Approaches?” *Bulletin of the World Health Organization* 83: 315–16.
- Moore, A., and J. S. Morrison. 2007. *Health Worker Shortages Challenge PEPFAR Options for Strengthening Health Systems*. Washington, DC: Center for Strategic and International Studies.
- Mozambique Country Coordinating Mechanism. 2006. “Proposal to the Global Fund for Funding for Round 6.” [[http://www.theglobalfund.org/search/docs/6MOZH\\_1381\\_595\\_full.pdf](http://www.theglobalfund.org/search/docs/6MOZH_1381_595_full.pdf)]
- NAC (National AIDS Council). 2005. “Source of Funds for 2005.” National AIDS Council, Lusaka, Zambia.
- Nazerali, H., M. O. Oteba, J. Mwonga, and S. Zaramba. 2006. “Medicines—Driving Demand for Health Services in Uganda.” In C. K. Tashobya, F. Sengooba, and V. Oliveira-Cruz, eds., *Health Systems Reforms in Uganda: Processes and Outputs*. London: London School of Hygiene and Tropical Medicine, Health Systems Development Programme.
- Oliveira-Cruz, V., C. Kurowski, and A. Mills. 2003. “Delivery of Priority Health Services: Searching for Synergies within the Vertical versus Horizontal Debate.” *Journal of International Development* 15: 67–86.
- Oomman, N., M. Bernstein, and S. Rosenzweig. 2007. *Following the Funding for HIV/AIDS: A Comparative Analysis of the Funding Practices of PEPFAR, the Global Fund, and the World Bank MAP in Mozambique, Uganda, and Zambia*. Washington, DC: Center for Global Development.

- . 2008. *The Numbers Behind the Stories: PEPFAR Funding for Fiscal Years 2004 to 2006*. Washington, DC: Center for Global Development.
- PEPFAR (The President's Emergency Plan for AIDS Relief). 2004a. *FY 2004 Country Operational Plan for Mozambique*. Maputo, Mozambique.
- . 2004b. *FY 2004 Country Operational Plan for Uganda*. Kampala, Uganda.
- . 2004c. *FY 2004 Country Operational Plan for Zambia*. Lusaka, Zambia.
- . 2005a. *FY 2005 Country Operational Plan for Mozambique*. Maputo, Mozambique.
- . 2005b. *FY 2005 Country Operational Plan for Uganda*. Kampala, Uganda.
- . 2005c. *FY 2005 Country Operational Plan for Zambia*. Lusaka, Zambia.
- . 2006a. *FY 2006 Country Operational Plan for Mozambique*. Maputo, Mozambique.
- . 2006b. *FY 2006 Country Operational Plan for Uganda*. Kampala, Uganda.
- . 2006c. *FY 2006 Country Operational Plan for Zambia*. Lusaka, Zambia.
- . 2007a. *FY 2007 Country Operational Plan for Mozambique*. Maputo, Mozambique.
- . 2007b. *FY 2007 Country Operational Plan for Uganda*. Kampala, Uganda.
- . 2007c. *FY 2007 Country Operational Plan for Zambia*. Lusaka, Zambia.
- . 2008. *Report to Congress by the U.S. Global AIDS Coordinator on the Use of Generic Drugs in the President's Emergency Plan for AIDS Relief*. Washington, D.C.
- Ssengooba, F., and E. Ekirapa Kiracho. Forthcoming a. *Performance-based Funding for HIV/AIDS Programs in Uganda*. Kampala, Uganda: Makerere University School of Public Health.
- . Forthcoming b. *HIV Donor Effects on the National Health System in Uganda*. Kampala, Uganda: Makerere University School of Public Health.
- SCMS (Supply Chain Management System). 2007. "Global Fund/World Bank/U.S. Government Coordinated Procurement Planning Initiative." [[http://scms.pfscm.org/scms/docs/papers/Coordinated\\_Procurement\\_June%2015\\_Presentation.pdf](http://scms.pfscm.org/scms/docs/papers/Coordinated_Procurement_June%2015_Presentation.pdf)]
- Uganda Country Coordinating Mechanism. 2007. "Proposal to the Global Fund for Funding for Round 7." [[http://www.theglobalfund.org/search/docs/7UGDH\\_1597\\_0\\_full.pdf](http://www.theglobalfund.org/search/docs/7UGDH_1597_0_full.pdf)]
- Uganda Ministry of Health. 2005. "Health Sector Strategic Plan II 2005/06–2009/2010." Volume I. Ministry of Health, Kampala, Uganda.
- UPHOLD (Uganda Program for Human and Holistic Development). 2005. *Annual Report 2005*. Kampala, Uganda: Uganda Program for Human and Holistic Development and United States Agency for International Development.
- USAID (United States Agency for International Development). 2007. *PEPFAR Uganda FY07 Semi Annual Program Results*. Kampala Uganda: Partnership Forum for Uganda AIDS Commission, USAID Kampala Office.
- WHO (World Health Organization). 2000. *The World Health Report 2000: Health Systems: Improving Performance*. Geneva.
- . 2008a. *Harmonization of Monitoring and Evaluation Requirements for ARV Procurement and Supply Management Systems*. Geneva.
- . 2008b. *Framework and Standards for Country Health Information Systems*. Geneva.
- WHO (World Health Organization) and Mozambique Ministry of Health. 2003. *Final report of the Second Joint Evaluation of health sector performance in Mozambique*.
- WHO (World Health Organization), UNAIDS (United States Agency for International Development), and UNICEF (United Nations Children's Fund). 2007. *Towards Universal Access: Scaling up priority HIV/AIDS interventions in the health sector*. Geneva.
- World Bank. 2002. "Project Appraisal Document on a Proposed grant in the amount of SDR 33.7 million US\$ 42 million (equivalent) to the Republic of Zambia for the Zambia National Response to HIV/AIDS (ZANARA) in support of the second phase of the Multi-Country AIDS Program for Africa (MAP 2) (APL)." Country Report

- 25034-ZA. Africa Regional Office, World Bank: Washington, DC.
- .2004. *Guidelines for Procurement under IBRD Loans and IDA Credits*. Washington, DC: World Bank. [<http://siteresources.worldbank.org/INTPROCUREMENT/Resources/ProcGuid-10-06-ev1.doc>]
- Yadav, P. Forthcoming. *Analysis of the Public, Private and Mission Sector Supply Chains for Essential Drugs in Zambia*.



