IMPROVING EFFICIENCY TO ACHIEVE HEALTH SYSTEM GOALS IN BOTSWANA

BACKGROUND PAPER FOR BOTSWANA'S HEALTH CARE FINANCING STRATEGY

September 2016

This background paper was prepared by Sharon Nakhimovsky, Jonathan Cali, Hailu Zelelew, and Carlos Avila on behalf of the Health Finance and Governance project.

The Health Finance and Governance Project
USAID's Health Finance and Governance (HFG) project helps to improve health in developing countries by expanding people's access to health care. Led by Abt Associates, the project team works with partner countries to increase their domestic resources for health, manage those precious resources more effectively, and make wise purchasing decisions. The five-year, $209 million global project is intended to increase the use of both primary and priority health services, including HIV/AIDS, tuberculosis, malaria, and reproductive health services. Designed to fundamentally strengthen health systems, HFG supports countries as they navigate the economic transitions needed to achieve universal health care.

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1. INTRODUCTION

Health outcomes have improved in Botswana over the last few decades. The maternal mortality ratio declined from 360 to 170 per 100,000 live births between 1990 and 2013, and deaths due to HIV/AIDS declined from 1,056 to 280 per 100,000 population between 2000 and 2012 (WHO 2015a). These successes have come at the same time as overall macroeconomic growth, with annual Gross Domestic Product (GDP) growth averaging around 6 percent between 2010 and 2015 (IMF 2015), and Human Development Index ranking above the regional average (Tlotlego et al. 2010).

These improvements originate in a strong health service delivery system. In 2008, Botswana's public health system included 338 health posts and 277 health clinics, sufficient to ensure that at least 80 percent of the population has coverage of essential, high-impact services (African Health Observatory 2016). Management of these services was initially done by the Ministry of Local Government but has been transferred to district health teams under the Ministry of Health (MOH). As of 2008, Botswana's public health system also had 17 primary hospitals, 14 district hospitals, two referral hospitals, and one mental health hospital; these hospitals are managed by the central government (GOB and WHO 2009). In addition, Botswana has eight private hospitals, 354 surgery centers, and 106 pharmacies, which supplement access to both general and specialized services throughout the country (Callahan et al. 2014).

However, challenges remain. Life expectancy at birth, though rising by 17 years between 2000 and 2013, remains lower than the average among upper-middle-income countries (WHO 2016a). While government programs have reduced HIV mortality, HIV incidence remains higher than the target, and adherence to treatment among people living with HIV is declining (UNAIDS 2015). At the same time, donors, which provided 52 percent of HIV program funding in 2010, are expected to reduce funding for Botswana in the near future (Callahan et al. 2014) – potentially by 10 percent in FY2017. Moreover, new care and treatment guidelines are expected to expand the number of patients who should receive anti-retroviral treatment (Panel on Antiretroviral Guidelines for Adults and Adolescents 2016), which will increase costs just as donor support for HIV declines, putting financial stress on other health programs.

These factors place pressure on domestic programs to raise additional revenue, and do more with less. Economic and health systems indicators demonstrate that Botswana could do more of both. Though economic growth has slowed from a high of 9 percent in 2013, it remains strong enough to give the Government of Botswana (GOB) room to expand fiscal space for health from domestic sources (IMF 2015; Duran-Valverde and Pacheco 2012). Also, comparisons with other middle-income countries indicate that Botswana could change the inputs, processes, or distribution of resources to increase outputs for the same investment. For example, Botswana spends more per capita but has worse health outcomes than Namibia, and its infant mortality rate is three times higher than in Mauritius though health spending per capita is comparable (World Bank 2016a). The MOH is aware of the inefficiencies within the country's health system and has documented its commitment to address them (WHO 2014).

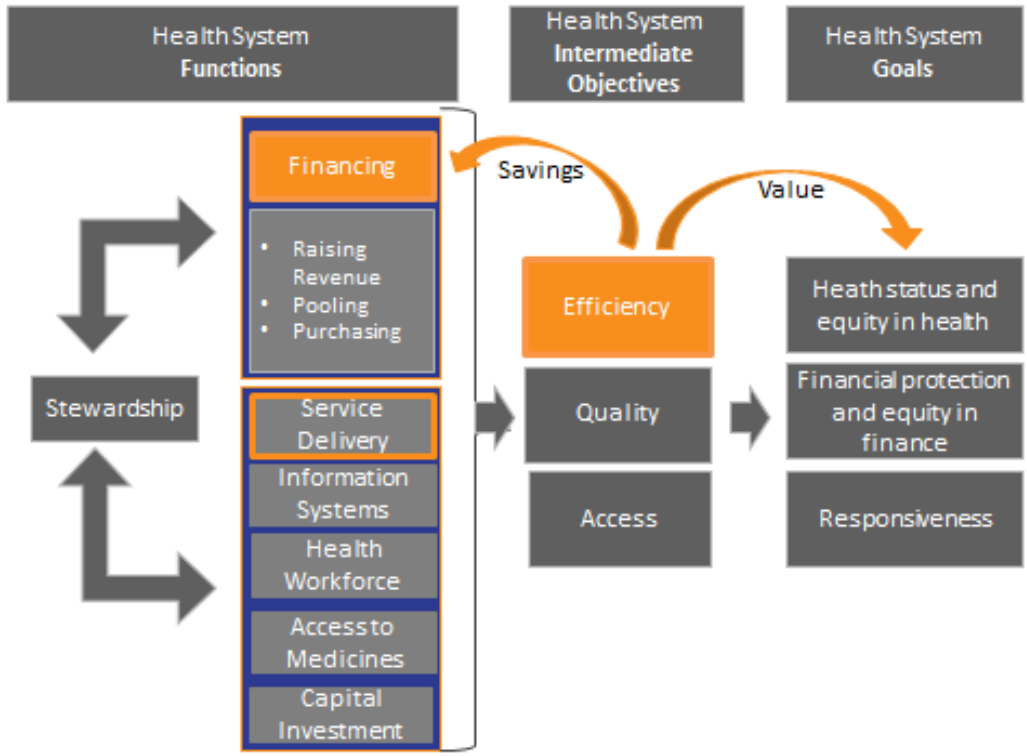
The purpose of this background paper is to discuss reforms for improving health system efficiency in Botswana. Section 2 presents a framework linking the functions and goals of the health system through the intermediate objective of improved efficiency is presented. The paper then explores ways to improve efficiency throughout the health system, including in financing (section 3.1) and through large-scale health financing reforms (section 3.2). The reforms suggested are relevant to the development of Botswana's health financing strategy and other health system policy discussions.

2. FRAMEWORK AND DEFINITIONS

Policy research typically draws on three universal concepts of efficiency and adapts them to the health system. **Productive efficiency** means that the health system produces the most health outputs (e.g., number of services delivered) or health outcomes (e.g., lowest mortality rates) for a given set of inputs (e.g., human, financial, and physical capital), with awareness of service quality. **Technical efficiency** means that the inputs used to deliver services are selected to minimize costs, also with awareness of service quality. **Allocative efficiency** means that resources are distributed in the population in a way that maximizes population health (Heredia-Ortiz 2013).

The framework in Figure 1 illustrates how improving productive, technical, and allocative efficiency can play a role in connecting health system interventions or reforms with the overall goals of the health system. These goals include good health status for all, including the poor; good financial protection for all, including the poor; and responsiveness of the health care system to the legitimate expectations of patients. Essentially, reforms directly improve efficiency, which in turn contributes to achieving health system goals by increasing the value of health system investments.

Figure 1. Improving Efficiency to Achieve Health System Goals



Source: Authors, adapted from Kutzin (2013) and WHO (2000)

Section 3.1 discusses reforms to improve efficiency across all health system functions – financing, governance, service delivery, information systems, health workforce, access to medicines, and capital investment. In some cases, such reforms yield savings that can be reinvested in the health system. Section 3.2 presents efficiency-related reforms that originate in the three functions specific to health financing – ideas which can directly contribute to the GOB's health financing strategy. Kutzin et al. define these functions as follows:

- "Revenue raising: sources of funds, contribution methods used, and mechanisms for their collection
- Pooling: arrangements for the accumulation of prepaid funds on behalf of a population within the system
- Purchasing: transfer of funds to providers on behalf of a population, incorporating both provider payment mechanisms and the organizational/institutional structure of the purchasers" (Kutzin et al. 2016).

3. DISCUSSION OF WAYS TO IMPROVE EFFICIENCY IN BOTSWANA

3.1 Improving Efficiency through Health System Strengthening

This section considers reforms throughout the health system that the GOB can consider to improve the efficiency of Botswana's health system. The discussion is divided into several sub-topics that cut across the health system functions: resource allocation by level of care, hospital management, public financial management (PFM), the procurement and use of technologies, and drug policy and supply chain management. For each sub-topic, the paper identifies the sources of current inefficiency in Botswana's health system that present opportunities for improving efficiency, and it lists potential reforms available to the GOB to address them.

3.1.1 Resource Allocation by Level of Care

Summary Points

Opportunities to improve efficiency

- The MOH budget allocates a very small amount to primary care activities and a lot to curative care. This does not align with stated policy commitments to primary care and is not a cost-effective use of public monies. Similarly, little funding is allocated to preventive care, which makes people healthier and more productive, and saves money by guarding people against infectious and noninfectious diseases, dangers caused by injuries, workplace hazards, disabilities, and environmental health threats. The current excessive reliance on curative care is expensive and unsustainable in the long term.
- Referral hospitals are overwhelmed with demand, including for non-specialized/emergency services, while many district hospitals are under-utilized.

Potential interventions

- Review previous recommendations on increasing the productivity of health workers within the system
- Consider downsizing operations at hospitals with excess capacity while reinvesting in other methods of delivering care
- Review human resource needs and use data to redistribute health workers within system
- Identify reasons for why households choose to seek care more at primary and referral hospitals than at district hospitals, and design interventions to strengthen the referral system accordingly
- Spend more strategically on infrastructure and institutionalize processes for assessing and approving capital investment proposals
- Increase investment in disease prevention and health promotion, ideally through integrated care

3.1.2 Opportunities to Improve Efficiency

The allocation of capital resources for health has produced or accentuated a misalignment between the capacity and utilization of hospitals in Botswana. In 2008, almost 50 percent of hospitals had more capacity than they used productively, making it likely that additional inputs will produce less output ("decreasing returns to scale") (Tlotlego et al. 2010). This imbalance is reflected in the occupancy rates, defined as the total number of inpatient days divided by available beds and number of days during a specific period. For example, occupancy rates at district hospitals were only 40–61 percent between 2000 and 2005. In contrast, Botswana's two general referral hospitals have insufficient capacity, with occupancy rates reaching 222 and 143 percent. One reason for the high occupancy rates at the referral hospitals may be that there are few lower-level facilities nearby the referral hospitals to accommodate primary care needs. Notably, at least some investment in expanding physical capacity occurred at hospitals with already low occupancy rates (Seitio-Kgokgwe et al. 2014). Primary hospitals are also overutilized relative to their capacity (GOB 2011).

Recurrent spending patterns also reflect a health system that prioritizes curative care delivered at hospitals. According to the most recent Health Accounts, more than 50 percent of total health expenditure was spent on curative care at hospitals while only 9 percent was spent on prevention and public health expenditure, even though much of the burden of disease in Botswana is preventable (GOB 2012).

These patterns of recurrent spending are not efficient for several reasons. First, health interventions in prevention and health promotion are among the most cost effective (Black et al. 2016). Second, overburdening Botswana's referral hospitals with non-emergency, non-specialized services reduces their productivity and the value of the investment put into them (Hensher, Price, and Adomakoh 2006). For example, overcapacity at referral hospitals (as indicated through high occupancy rates) can block access to needed services. It is also linked to greater incidence of adverse events, including the spread of multi-antibiotic-resistant organisms, which results in an unnecessary health and cost burden (Morton 2011). Finally, outpatient services that do not require the technology or medical expertise available at higher-level facilities can be provided less expensively at lower levels of care – as long as the primary care system in Botswana provides high-quality services that are responsive to local needs (WHO 2011a). Nor are these patterns of recurrent spending effective. While knowledge of HIV among youth in Botswana increased 5 percentage points from 2008 to 2013, overall it remains low (47 percent). Over the same period the use of condoms in risky encounters declined by 9 percentage points (UNAIDS 2015).

3.1.2.1 Potential interventions to improve efficiency

Review previous recommendations on increasing the productivity of health workers within the system: Almost 10 years ago, Botswana's Human Resources Strategic Plan found "…that productivity levels in the public health facilities are generally low and the trend towards professionalism and entitlement is rapidly undermining the capacity to provide appropriate, accessible and affordable services..." (GOB n.d.). The plan proposed several interventions to improve efficiency such as to reduce absenteeism, more flexible staffing by workload instead of rigid norms, and decentralized decision-making and supervision. There are likely other analyses and initiatives in this area. Botswana has moved forward on some of these recommendations but not all.

Consider downsizing operations at hospitals with excess capacity while reinvesting in other methods of delivering care: "Downsizing" may require transferring staff to lower levels of care where additional capacity is needed (Tlotlego et al. 2010). However, the GOB may also want to consider the literature on downsizing hospital operations in Europe, North America, and Central Asia where studies have been conducted. The studies show mixed results. For example, in some cases, service quality or access to care diminished as a result of the interventions. A lesson learned that emerged is that outcomes are better when such interventions are accompanied by investments in other, more appropriate methods of providing displaced care (McKee 2003). These studies also indicate that getting rid of excess beds that are not used will not alone improve efficiency in a significant way (McKee 2003). Rather, transferring resources, especially health workers, may help solve the seemingly inefficient distribution of human resources for health in Botswana's health system.

Conduct a review of human resource needs and use data to redistribute health workers within system:

To systematically assess opportunities to address under- and overcapacity at facilities, the GOB can consider using WHO's Workload Indicators of Staffing Need (WISN) tool. WISN is a management tool for systematically assessing the need for, and pressure on, health workers across facilities. WISN indicators can help governments determine how to allocate new staff, or transfer existing staff, to achieve a more equitable and efficient distribution (WHO 2010a). However, conducting WISN is a time investment itself. Before embarking on this analysis, the GOB should weigh the benefits of the results for achieving related efficiency objectives against the costs – in terms of MOH staff time – to estimate them.

WHO's WISN Tool

"The WISN method is based on a health worker's workload, with activity (time) standards applied for each workload component. The method:

- Determines how many health workers of a particular type are required to cope with the workload of a given health facility;
- Assesses the workload pressure of the health workers in that facility."

WISN indicators can inform decisions about allocating new or transferring existing staff or functions; determine staff needs to achieve higher standards, and plan for future service delivery needs.

WHO (2010a)

Assess reasons for why households are choosing to seek care at primary and referral hospitals but less at district hospitals, and design interventions to strengthen the referral system accordingly: Reasons could be related to service quality, financial barriers, or availability of needed services and medicines. Assessment of financial barriers should be prospective as well as retrospective to account for the ongoing departure of donors currently subsidizing health goods and services for the poor. Based on the findings from this assessment, consider designing interventions to strengthen the referral system and better align demand with capacity. Such interventions may include:

a. Investing more in public health campaigns to stimulate demand for outpatient services that could both address underutilization of services and unnecessary use of expensive specialized services and primary and referral hospitals.

b. Revising the health benefit plan that subsidizes primary care at pre-specified providers to prioritize specific interventions that are deemed cost-effective and exclude (or reduce the subsidy for) costly health services that provide less benefit per dollar for the population (Glassman and Chalkidou 2012). Match this effort with quality improvement plans and monitoring systems that can ensure adequate quality of primary care at lower-level facilities. The advantages of health benefit plans are discussed in more detail in the second section of this brief.

c. Consider developing effective patient transportation, creating walk-in ambulatory services separated physically from hospital buildings, or investing in alternative facilities for providing high-quality primary care. (Hensher et al. 2006).

Invest future infrastructure spending for health more strategically and institutionalize processes for assessing and approving capital investment proposals: Strategic infrastructure investment will require basing decisions about location and scope (including size and function) on demographic and market studies, volume analyses, and strategic planning. This type of planning, especially when it avoids investment in projects too large in scope relative to need, can allow governments to capture short-term cost savings and long-term return on investment from these infrastructure projects (PricewaterhouseCoopers 2012). Such efforts may address existing distortions in facility capacity, improving efficiency throughout the system. For example, one option to explore is to build or expand primary or district hospital capacity near to the referral hospitals to alleviate the burden of non-specialized demand in that area (Tlotlego et al. 2010, Hensher et al. 2006). This intervention would involve additional investment in urban rather than rural areas, which run counter to arguments for moving funding from urban to rural areas. However, even as the GOB addresses potential urban-rural equity issues, urban-specific inefficiencies should not be overlooked (Hensher et al. 2006). The GOB should also consider developing an explicit process for scoping, budgeting, and approving capital projects in the health system (PricewaterhouseCoopers 2012). This type of process could ultimately develop into a Certificate of Needs legal system, as South Africa has done recently. However, Certificate of Needs systems are controversial, and their development should proceed with full engagement of public and private health care providers.

Invest more in disease prevention and health promotion, ideally through integrated care: Kyrgyzstan's reforms between 1996 and 2010 offer examples of successful actions taken to improve efficiency by increasing the relative allocation of public health spending to prevention. Interventions included developing family medicine practice, whereby specialists in internal medicine, OB/GYN, and pediatrics, along with midwives and nurses, provide integrated primary care, thus avoiding the inefficiencies of vertical programs and fragmented solo-specialist care. These "family medical groups" are supported by smaller "fledsher-midwifery centers" in rural areas, and by more formal "family medical centers," which provide outpatient care and diagnostics. As a result of these efforts, the percent of public health expenditure allocated to primary care increased from 26.4 percent in 2005 to 37.7 percent in 2009 (Ibraimova et al. 2011). Efforts to reduce excess hospital beds (per above) resulted in savings that supported the government's objective of prioritizing cost-effective primary care services (Ibraimova et al. 2011).

3.1.3 Hospital Management

Summary Points

Opportunities to improve efficiency

- Hierarchical and centralized management structure creates delays, impedes effective supervision, and may prevent adequate response to hospital needs.
- Managers do not have the training they need, and their roles are not well defined.
- There is low morale among hospital workers.

Potential interventions

- Decentralize management of facilities, giving hospital managers greater authority to respond to facility needs
- Empower hospital management teams through holistic investment in information systems and capacity building in using the data
- Revise the curriculum for training hospital managers
- Consider policies to incentivize task shifting or task sharing

3.1.3.1 Opportunities to improve efficiency at hospitals

Hospitals accounted for 72 percent of MOH spending in 2009/10 (GOB 2012). Thus, making hospitals more efficient may have significant benefits for the whole system. One key area to address is hospital management structures. A study by Seitio-Kgokgwe et al. (2014) indicates that the current overly hierarchical and centralized management structure gives little authority to hospital administrators to respond as needed to local needs. Communication delays create situations where needs are not met, and supervision is poor. The study also highlights a lack of clarity in the roles and needed skills of managers versus superintendents, and questions whether some managers have the experience and skills needed to manage effectively, given their clinical background. These problems cause and are exacerbated by low morale among health care workers (Seitio-Kgokgwe et al. 2014). Overall, these problems prevent Botswana's hospitals from optimizing their human and physical capital in the delivery of quality care.

Weaknesses in the health information system (HIS) also limit opportunities for hospital management to improve efficiency (and service quality) incrementally. However, a recent assessment of Botswana's HIS highlights remaining challenges, including:

- Insufficient budgetary and institutional commitment to the development of the HIS overall, as reflected in the lack of a specific budget line item for HIS strengthening activities and lack of development in policy to support investments in information technology and communication systems.
- Insufficient capacity of HIS staff at all levels
- Fragmented and overlapping information systems developed without a comprehensive national HIS strategic plan

Hospital staff will not be able to effectively and efficiently monitor and make real-time adjustments to improve efficiency when they lack clear and integrated standards, are burdened by fragmented and overlapping reporting systems, and do not receive data in a timely manner (Seitio-Kgokgwe et al. 2015).

Of course, the GOB has long recognized the importance of improving the HIS. Its latest efforts to improve it are reflected in the National Health Service Plan. This document sets out plans to address fragmentation in the HIS, clarify roles and responsibilities of various institutions, and identify core indicators to monitor, and strengthen data use (Seitio-Kgokgwe et al. 2015; GOB 2010).

3.1.3.2 Potential interventions

Decentralize management of facilities, giving hospital managers greater authority to respond to facility needs: While the management of health posts and health clinics is under local health ministry control, hospitals remain under centralized management. As reform in this area continue, the GOB should consider new management structures that can address some of these challenges while retaining transparency in the use of funds at the hospital level.

In addition to decentralization of authority, the GOB may also consider how to incentivize efficiency and quality. For example, in the Dominican Republic, hospitals participated in the Center of Excellence program to improve the quality and efficiency of maternal and child health service delivery. These hospitals established "change management teams" that represented staff from many areas and that spearheaded initiatives to improve customer service, increase staff compliance with clinical protocols, and reduce medical errors (Abt Associates 2013). Hospitals paid for these initiatives out of their operating budget. These teams conducted work planning, monitoring, and other activities to make their hospitals commit to evidence-based planning (Abt Associates 2013).

Empower hospital management teams through holistic investment in information systems and capacity building in using the data: Trying to improve hospital efficiency or service quality without data is like shooting in the dark. Generating more consistent and accurate clinical and operating data is a priority challenge for hospitals in countries of all income levels. Armed with these data, and given the autonomy to manage in a flexible, locally responsive, and transparent way, hospital management teams could be well positioned make adjustments to service delivery in ways that improve efficiency.

A nationally standardized set of indicators for tracking efficiency can support this process, and the GOB should consider including such a list in its core monitoring indicators. Holistic investment in the information system, not just in information and communication technology infrastructure, along with capacity building in the gathering and use of monitoring data, will also be critical to empowering staff to participate in continual improvements of efficiency at the facility level. Similar interventions can help institutionalize efficiency-improvement processes at other types of facilities and local government offices as well. As the largest payer, the government can introduce incentives for investing in HIS such as hospital payment systems that require data or a bonus payment for achieving specific HIS targets. The government can also facilitate and reduce the cost of HIS by setting industry standards (e.g., adopting a standardized billing format, ICD-10 codes, and a universal provider identification code system).

Revise the curriculum for training hospital managers: In Ethiopia, the MOH introduced a Master's program in hospital management to create a supply of qualified personnel with skills matching the tasks of this position, allowing clinical staff to continue providing medical care (Kebede et al. 2010). Botswana may want to consider a similar program, or look for regional opportunities for supporting the training of local talent.

Consider policies to incentivize task shifting or task sharing: This idea has had widespread attention in sub-Saharan Africa, and the World Health Organization (WHO) has guidelines devoted to outlining relevant policies. A recent systematic review of 84 studies from sub-Saharan Africa found evidence from South Africa, Uganda, Rwanda, and other countries that task shifting can improve efficiency as well as access to care. For example, task shifting is estimated to increase the capacity of doctors to complete non-HIV related tasks by 183 percent (Callaghan et al. 2010). Another systematic review indicated that task sharing in the delivery of anti-retroviral therapy is most effective when implemented along with other interventions (Emdin and Millson 2012). However, these policies need to be carefully designed. Other sub-Saharan African countries implementing task-shifting policies have faced challenges, including "maintaining quality and safety; addressing professional and institutional resistance; sustaining motivation and performance and preventing deaths of health workers from HIV/AIDS" (Zachariah et al. 2009). The GOB should consider task-shifting or task-sharing policies in light of the positive results of these systematic reviews. However, it should also keep the realities of Botswana's HIV and health system in mind, as the impact of such policies may differ in countries and disease areas not studied. The GOB may also consider using the WISN tool, mentioned in the section on resource allocation, which also helps inform decisions about assigning functions to health workers (WHO 2010b).

3.1.4 Public Financial Management

Summary Points

Opportunities to improve efficiency

- Weaknesses in the government-wide PFM system include outdated legislation, insufficient capacity for auditing and accounting of public expenditures, and a lack of controls in new computerized systems.
- Reform of government-wide PFM can take time to reach and be integrated into health systems. However, it is often the case that the health system can "go it alone" and blaze the PFM trail.
- PFM systems might not align with health financing functions.

Potential interventions

- Conduct an assessment of PFM performance that is specific to the health sector and apply lessons learned to improve revenue and expenditure outcomes
- Build capacity of local health offices in financial transparency, potentially with an incentives program that targets and rewards efficiency metrics

3.1.4.1 Opportunities to improve efficiency through better financial management systems and practices

The World Bank asserts that PFM "refers to the budgeting, accounting, internal control, funds flow, financial reporting, and auditing arrangements by which they receive funds, allocate them, and record their use" (World Bank 2016b). A broader definition from The Chartered Institute of Public Finance and Accountancy (2010) states that PFM is "the system by which financial resources are planned, directed and controlled to enable and influence the efficient and effective delivery of public service goals." For WHO, PFM systems refer to a set of rules that "govern how budgets are formed, disbursed, and accounted for" (WHO 2016b).

> "The Paris Declaration, Accra Agenda for Action and the Busan Partnership for Effective Development Co-operation commit countries to strengthen their Public Financial Management systems and commit development partners to increase the amount of external assistance that flows through a country's PFM system – not as an end in itself – but as part of efforts to achieve more effective and sustainable development."
>
> OECD (2016)

Irrespective of the PFM definition they embrace, countries have articulated strong commitments to improving PFM as part of their development strategy. The commitments stem from universal recognition of PFM's role in a country's capacity to deliver public goods funded by public resources efficiently and effectively. Inversely, weaknesses in these systems and misalignments between government-wide and sector-specific financial management processes can introduce bottlenecks, and thus inefficiencies, in public spending, including in health (WHO 2016c).

Weaknesses in PFM result in inefficiencies for the health sector. For example, opportunities for leakage of health resources can emerge when internal controls are weak, auditing systems are inconsistent, available data are not reliable, and/or data are not made transparently accessible to the public. The GOB identified similar PFM weaknesses, which likely lead to inefficient spending in health and other sectors in Botswana (Association of Chartered Certified Accountants 2010). Specifically, the weaknesses the GOB identified included:

- Legislation on PFM was not up-to-date.
- Capacity within the GOB's auditing and accounting offices was insufficient.
- New computerized accounting and budgeting systems did not have proper controls.
- "Accounting processes and ledgers were not kept up-to-date."
- "An inadequate cash accounting system used by government ministries and local authorities."

Equally damaging to the health sector is when budget execution routinely varies widely from budgets formulated in alignment with health policy objectives. Such misalignment is consistent with the lack of *program-based budgeting*[1] in the public sector at large – as is the case in Botswana. The end result is invariably that investments are less than optimally directed to achieve stated policy objectives and fail to return acceptable value.

The GOB has been actively engaged in addressing these weaknesses (Association of Chartered Certified Accountants 2010). Even so, the fact that PFM extends throughout the government complicates the process of reform for individual ministries such as health. Actions initiated at higher levels of government can take time to reach a health ministry, and when they do health stakeholders may not understand or agree to abide by them (Todini 2013). Also, strong PFM for the health sector requires alignment between the government-wide PFM systems and the health financing functions and objectives of the MOH.

3.1.4.2 Potential interventions

Conduct an assessment of PFM performance that is specific to the health sector and apply lessons learned to improve revenue and expenditure outcomes: Recent assessments of PFM in Botswana looked at the health system comprehensively (Association of Chartered Certified Accountants 2010; GOB 2013). However, assessments covering the entire government PFM system like these, and the generic recommendations they make, often fail to percolate down to line ministries. Health-centric PFM assessments and interventions are a more targeted and focused way to positively impact efficiency of MOH revenue and expenditures, contributing to a better allocation of resources for health outcomes. The HFG project has developed and used a toolkit for health sector managers that may be helpful, especially with reference to the "Guided Self-Assessment of Public Financial Management Performance" (Todini 2013).

[1] The core objective of program budgeting is improved expenditure prioritization. Expenditure prioritization means that limited government resources are allocated to the programs that deliver the greatest benefits to the community given the money spent (World Bank 2013)

Assess the accounting and information system for conformity to a program-based budgeting system. Traditional budget planning and allocations revolve around the usual Ministry of Finance requirement to budget and track expenditures based on line items. This model emphasizes inputs and not outcomes. What is the use of reporting on payroll costs and fuel usage when no connection can be made to results or to activities for which those persons or the 10 liters of gasoline were used? With program-based budgeting, managers need to think about these questions: what programs will I run in the coming years? What activities will be necessary to run those programs? What inputs will each activity require? In this model, the line items are only the sum of all inputs required by specific activities, a means and not an end. The reward at the beginning of the process is to oblige health managers to prioritize based on desired results. At the end of the process, there is the ability to monitor and ensure the rational and effective use of scarce resources. Program-based budgeting requires an adequate accounting system and recording process but it can be effectively implemented with the participation of all levels of the health system. The tools used will be simpler at the grassroots level and increasingly sophisticated as the model is applied at secondary and tertiary care levels.

Build capacity of local health offices in financial transparency, potentially with an incentives program: After receiving technical assistance from the United States Agency for International Development's (USAID's) Wajibika project (2009–2013), local health offices in Tanzania increased financial transparency in PFM, successfully demonstrated by the increase – from 44 percent (2010/11) to 85 percent (2011/12) – in clean audit results from the Controller and Auditor General. This achievement also translated into additional revenue for councils, given that a clean audit report entitled a council to 100 percent of its annual Capital Development Grant plus a 20 percent bonus, while an adverse audit report resulted in only 30 percent of the grant allocation (Wajibika Project 2013). The GOB may want to consider similar conditional allocations programs that reward good performance within local government offices and improve transparency and efficiency of PFM in the health system.

3.1.5 Procurement and Use of Technologies

Summary Points

Opportunities to improve efficiency

- In some hospitals, equipment purchased has more functionality than the hospitals need or have the capacity to use.
- In contrast, other hospitals lack basic equipment, indicating that resources are not distributed in accordance with need and with the principle of equity in mind.
- Maintenance of hospital equipment is sometimes poor.

Potential interventions

- Conduct routine needs assessments for medical technology as part of a medical equipment inventory management system
- Apply findings from health technology assessments to purchasing decisions

3.1.5.1 Opportunities to improve efficiency in the procurement and use of technology

Recent studies document challenges selecting, distributing, and maintaining hospital equipment in Botswana. One study highlights inequity in the distribution of equipment, with some facilities having insufficient equipment and others having sophisticated technology they do not fully use (Seitio-Kgokgwe et al. 2014). This issue reflects the inefficiencies in resource allocation and higher-level hospital management addressed in previous sections. At a facility with sophisticated equipment, one health worker stated that facility staff only used a small percentage (less than 1 percent) of the potential functionality the equipment offered (Seitio-Kgokgwe et al. 2014). This challenge indicates a need to conduct assessments of facility needs and application of health technology assessments (HTAs) (cost-effectiveness studies for new technology) as part of the process for procuring in the purchasing of equipment. In the same study, 57 percent of the 389 health workers surveyed stated that machines in their hospitals are broken down and poorly maintained. Most managers agreed with these health workers, emphasizing a lack of authority and functional procedures to properly maintain facility equipment (Seitio-Kgokgwe et al. 2014).

Cost-effectiveness analysis is a way to determine whether a given mix of interventions can minimize costs. Cost-effectiveness estimates are used to improve allocative efficiency.

3.1.5.2 Potential interventions

The findings above indicate a need to establish processes for strategically assessing the need for, and procurement and distribution of new medical technology. This is critical for Botswana, because new technology can drive cost savings or cost escalation (Sorensen 2013). Technological advancement is occurring rapidly in the health sector. Establishing processes for strategic decision-making can help the GOB save Botswana money both now and in the future.

The GOB has already taken active steps to address inefficiencies in medical technology. At least on paper, the MOH has a HTA management unit, has established a Division of Medical Equipment Management Services to create and manage implementation of new systems governing medical equipment, and has a national policy on health technology (GOB n.b.). Potential solutions listed below build upon this promising beginning and extend to the larger context of establishing better processes for priority setting.

Conduct routine needs assessments for medical technology as part of a medical equipment inventory management system: Such processes, in line with WHO guidelines, can facilitate better understanding of facility needs and better align allocation of resources for new equipment to facilities throughout the country (WHO 2011b). This idea is also in Botswana's medical technology policy, but still needs to be implemented. Sufficient institutional support needs to back the unit (Division of Medical Equipment Management Services) to make this happen.

Apply findings from HTAs to purchasing decisions: Provide more clarity on the role of cost-effectiveness. The current criteria for selecting equipment covers both effectiveness and cost, but does not explicitly mention the importance of cost-effectiveness, nor does it point to specific data sources (such as HTAs) best situated to inform these decisions. The GOB may also consider expanding the role of the MOH's national health technology management unit. The fact that the GOB did not participate in WHO's recent survey on HTAs in decision making may reflect a low investment of financial and human resources in this institution, despite its potential important role in controlling costs and improving efficiency (WHO 2015b).

The GOB may want to consider experiences from Malaysia in incorporating HTAs into decision-making processes. The MOH of Malaysia has an HTA unit that, in 2013, conducted 58 HTAs, 18 percent of which were for medical devices (Malaysian HTA Section 2014). The GOB can also consider ways of leveraging global HTA and other cost-effectiveness resources (e.g., the Disease Priority Project 3 http://dcp-3.org/) to reduce the research costs and still create effective ways to apply cost-effectiveness criteria to decisions about acquiring new technologies.

3.1.6 Policies for Drug and Supply Chain Management

Summary Points

Opportunities to improve efficiency

- IT infrastructure and human resources constraints at the central medical store (CMS) inhibit rigorous procurement, forecasting, and planning.
- Human resource constraints at the facility level also introduce inefficiencies.
- Results: higher drug prices and frequent stock-outs.
- Insufficient data for monitoring and communication.

Potential interventions

- Reduce drug costs by institutionalizing recent improvements and leveraging regional collaboration
- Consider the informed push model of distribution
- Consider using incentives to improve CMS performance
- Use mobile phone technology to support better communication across levels/tiers of the procurement chain
- Consider ways of leveraging the private sector - for example, partnerships for shared distribution infrastructure
- Review consumption patterns of generic drugs and consider options for addressing any barriers to expanding their use

3.1.6.1 Opportunities to improve efficiency through drug policy

Systems for procuring and delivering medicines and other medical supplies are centralized around the GOB's CMS. Although the CMS is transitioning to semi-autonomous management (Watson and McCord 2013), it remains at the core of these systems. CMS capacity constraints, particularly in terms of IT infrastructure and human resources, thus affect the entire supply chain and the efficiency of health service delivery. With the MOH reporting drug availability at 89 percent on average in 2015, improvement in this area is a ministry priority (All Africa 2015).

Currently, the GOB is working on addressing human resource constraints, but many issues remain and continue to create inefficiencies in Botswana's health system. Of particular importance are the limitations in capacity to conduct forecasting and drug costing (SCMS 2012). These limitations are likely one key reason for frequent stock-outs in Botswana's hospitals (Seitio-Kgokgwe et al. 2014). Staff shortage is a problem in Botswana at the facility level, where an insufficient number of pharmaceutical personnel weakens supply chain management systems (All Africa 2015). Additionally, high staff turnover may exacerbate human resource shortages and challenge efforts to institutionalize capacity-building successes (SCMS 2012). Other capacity constraints in purchasing and supply chain management are related to a lack of sufficient IT, including for inventory and logistics information management, and physical infrastructure, such as for warehousing lab commodities (SCMS 2012).

Such constraints can reduce efficiency in supply chain management. For example, given insufficient staff and IT infrastructure, the CMS experienced a severe back-log of applications to register new and potentially less expensive drugs. This problem may have caused the GOB to purchase drugs at much higher prices. Moreover, with stock-outs come poor health outcomes despite investment in all of the other inputs available.

Another inefficiency relates to central-level management, where there may be many agencies involved in parallel processes. The Supply Chain Management Systems (SCMS) project lists nine agencies within the MOH that are involved in procurement and supply chain management as part of the HIV response (SCMS 2012). The actual number of agencies is likely to be even higher when considering the entire health system. A regional document notes that this problem is common throughout Southern African states, and can "stretch the already overwhelmed public sector medicines supply systems" (SADC Secretariat 2007). UNAIDS also notes that there is a greater need for greater integration of procurement mechanisms across vertical programs (UNAIDS 2015).

Botswana may also encounter other problems that are common in the region. One is insufficient quality control, particularly in the context of where there is "production of substandard/counterfeit medicines" (SADC Secretariat 2007). This problem is listed among the top causes of inefficiencies related to health systems (Chisholm and Evans 2010). More generally, a lack of data on supply system management performance indicators in global databases such as WHO's Global health Observatory (WHO 2016a) points to insufficiencies in data for monitoring and communication throughout the system – another problem likely implicated in stock-outs. The extent to which generic drugs are prescribed by doctors and accepted by patients is also an important factor in a health systems' efficiency, though little documentation on current consumption patterns in Botswana is available.

3.1.6.2 Potential interventions

Reduce drug costs by institutionalizing recent improvements and leveraging regional collaboration: A short-term increase in staff with support from the PEPFAR-funded SCMS project resolved a severe back-log of applications to register new and potentially less expensive drugs temporarily (SCMS 2012). As a result, prices of anti-retroviral drugs procured by the GOB have dropped by 15 percent (SCMS 2012). Efforts to institutionalize changes under the project can help sustain these and other achievements in the future. The GOB can further reduce prices through regional collaboration, given the large regional market for potentially affordable essential medicines (SADC Secretariat 2007). Ongoing GOB efforts to maneuver around apparent bottlenecks posed by regional trade agreements will also help support future reduction in prices (United Nations Industrial Development Organization 2010).

Consider the informed push model of distribution for some medicines and commodities: This "push" model assigns the responsibility for taking stock of inventories and calculating "top-up" amounts to the teams delivering the goods, rather than the overstretched workers at health facilities. A costing study in Zimbabwe compared this model for delivering family planning commodities to the traditional "pull essential drug system." It revealed that the average cost for delivering US$1 of health commodities using the push model was lower than the average cost for the traditional pull model when overall quantities to deliver are relatively small – for example, those needed for a primary health care center. For larger deliveries, the traditional pull model will be less costly (Sarley et al. 2010). The push model is currently being rolled out in Senegal, where initial pilots in two health centers resulted in dramatic decreases in stock-out rates (83 percent for implants and 43 percent for Depo Provera) after one year of implementation (IntraHealth International 2016).

Consider using incentives to improve CMS performance: In Mozambique, a results-based financing program targeting the CMS was introduced in 2013 with USAID support. This program was intended to improve the efficiency and performance of the supply chain in the areas of planning, distribution, and warehouse management. An assessment after one year indicated that the incentives can improve efficiency and performance through "1) improved staff motivation 2) improved collaboration and cooperation and 3) increased investment in supply chain infrastructure" (Spisak and Morgan 2014). The GOB may want to consider whether a similar model could work in Botswana.

Consider ways of leveraging the private sector: For example, to address insufficiencies in its physical infrastructure for distributing medicines and commodities, the GOB could consider partnering with private distributors and sharing distribution infrastructure (Hayford et al. 2011). If the scope of private organizations is not known, the GOB may consider conducting a mapping of private actors involved in supply chains for health or non-health products to identify potentially beneficial relationships.

Codify an evidence-based process and timeline for updating the essential medicines list: A WHO review of South Africa's experience suggested that the essential medicine list needs to be updated "constantly." The update process should include the exclusion of previously qualified medicines and inclusions of new medicines. To improve efficiency, it should be informed by cost-effectiveness analysis ("pharmaco-economic analysis"). Though pharmaco-economic analysis is not yet a part of the update process in South Africa, it has been identified as one of the two most important remaining tasks within medicines to improve efficiency (Gray et al. 2015). The GOB may not need to conduct such cost-effectiveness analysis independently, but may instead work collaboratively with regional bodies such as the Southern African Development Community (SADC) and global communities compiling updated information.

Review consumption patterns of generic drugs and consider options for addressing any barriers to expanding their use: A recent systematic review identifies negative perceptions among stakeholders, perverse incentives from the private sector, and the absence of regulations for generics substitution as common barriers to the broader use in low- and middle-income countries (Kaplan et al. 2012). The GOB should consider a thorough assessment of the barriers to greater prescribing and uptake of generic drugs in Botswana and design targeted strategies to address them.

3.1.7 Limitations

This section presented short-term opportunities for improving efficiency given the latest available literature on Botswana's health system. There are likely additional opportunities for the GOB to consider. For example, it want to consider if a health system assessment, or sub-sector assessments, could provide a better understanding of the drivers of inefficiency that can be used to inform policy and operations.

3.2 Improving Efficiency through Comprehensive Health Insurance Reform

Botswana can consider adopting one or more of the incremental interventions discussed in the first half of this brief to improve efficiency. The GOB can also consider the potential for comprehensive health financing reform to enhance health system efficiency. Comprehensive reform, such as the implementation of a national or social health insurance system, involves changes to how revenue is collected, how risks are pooled across the population, how health providers are paid, which benefits the population is entitled to, and how the government oversees and regulates the system (Kutzin et al. 2016).

Comprehensive reform is politically and operationally difficult to implement, but countries all over the world, including in sub-Saharan Africa, are attempting ambitious overhauls of their health care systems. Reforms throughout the health system can work in tandem with interventions to improve efficiency. Several pathways to enhancing efficiency include: 1) integrating risk pools to reduce administrative costs and take advantage of economies of scale, 2) reallocating funding to cost-effective interventions through an explicit health benefit plan, and 3) improving the technical and allocative efficiency of health spending by incentivizing providers to deliver specific services or outcomes at a lower cost through strategic purchasing.

3.2.1 Integrating Risk Pools

Health systems with many small, fragmented risk pools may waste money by duplicating administrative functions and failing to take advantage of economies of scale (Kutzin et al. 2016; WHO 2010b). Many countries are merging smaller insurance schemes covering different segments of the population into single national insurance funds to reduce duplication of administrative functions and associated costs. Larger risk pools also have more bargaining power when negotiating reimbursement rates with providers and drug prices with pharmaceutical companies and equipment manufacturers. For example, the Republic of Korea improved efficiency by merging 227 not-for-profit insurance funds for the self-employed, 142 funds for formal sector employees, and a national health insurance scheme for government employees into a new single insurance agency called the National Health Insurance Corporation. After the merger of health insurance funds, the share of insurance expenses spent on administration declined from 7.9 percent to 2.4 percent over the course of 12 years, and the insurance system has increased its bargaining power with providers (Yip and Hafez 2015; Kwon 2015).

The GOB's public provision of services represents a single large risk pool, but there is considerable fragmentation of risk pools in the private sector. Each of Botswana's nine private medical aid schemes (MAS) represent a separate risk pool that uses beneficiary premiums to pay for advertising, management, and administrative staff salaries. The relatively small number of beneficiaries in each of these schemes, ranging from 69,000 principal members in the Botswana Public Officer's Medical Aid Scheme (BPOMAS) to fewer than 15,000 principal members in smaller schemes, means that a significant percentage of each member's premium must be used to pay for operational costs rather than finance health care provision (Callahan et al. 2014).

The GOB's subsidization of civil servants' membership in BPOMAS may represent another source of inefficiency due to fragmentation of risk pools. Currently, the GOB offers its employees subsidies to join BPOMAS and receive care from private providers, but also funds their health care through nearly free public health facilities. This represents a duplication of publicly financed health coverage for more than 69,000 members of BPOMAS. The GOB should consider how new pooling structures could address this issue.

3.2.2 Reallocating Funding to Cost-effective Interventions

Comprehensive health insurance reform requires health systems to define which interventions or health conditions will be covered by the insurance package (Chalkidou et al. 2016). Countries can use resources more efficiently by prioritizing the interventions that have the largest health impact given the country's disease burden. Evidence shows that prioritizing the most cost-effective interventions can result in an anywhere from 11 percent to 99 percent improvement in health outcomes for the same level of expenditure (Priority-setting institutions for global health working group 2012). Health benefit plans explicitly define which benefits are covered or not covered under an insurance scheme or tax-funded health system. Health benefit plans have been adopted by at least 64 low- and middle-income countries, including Ghana, Kenya, Namibia, Nigeria, South Africa, Tanzania, Uganda, and Zambia (Priority-setting institutions for global health working group 2012). As previously mentioned, health technologies and medications can also be assessed for cost-effectiveness and subsequently included or excluded from the insurance package.

In Botswana, the costing of the essential health services plan in 2014 demonstrated that Botswana would not be able to finance all interventions in the package with current levels of health resources (Menon et al. 2014; Cali and Avila 2016). GOB should consider this mismatch between projected costs and actual funding seriously, given the experiences other countries have had implementing similar reforms without, or in opposition to, similar information. For example, the government of Ghana did not have long-term projected costs before it initiated the National Health Insurance Scheme (Priority-setting institutions for global health working group 2012). Over the last decade, claims liabilities associated with the scheme have increased much more quickly than revenues, and the scheme now faces serious sustainability challenges (Otoo 2016). In Colombia, the government allocated fewer resources than advisors estimated were required. Years later, health care providers were nearly bankrupt and needed a bailout from the government (Bustamante and Mendez 2014). There are also suggestions that Botwana's proposed benefits package does not prioritize cost-effective interventions or exclude many interventions that should not be covered by public financing.[2] Insurance reform would give Botswana the impetus to revise its essential benefits package and establish a procedure for regularly reviewing the package based on cost-effectiveness and actuarial analysis, and the mechanism for legally excluding coverage for interventions that are not cost effective.

3.2.3 Improving Efficiency through Strategic Purchasing

Comprehensive health insurance reform can allow health systems to alter the way they pay providers in order to incentivize them to obtain specific, pre-determined outcomes for the least possible cost. Currently, Botswana pays its public health facilities through line-item budgets that purchase inputs such as medicines, supplies, and equipment. Payments to facilities are not linked to desired outputs or outcomes such as the number of people treated, the number of services provided, adherence to an essential services package, or the quality or cost of health services.

There are many purchasing mechanisms in use globally, and each has advantages and disadvantages. Input-based purchasing, such as the model currently used in Botswana's public sector facilities, tends to encourage providers to spend money on equipment, infrastructure, human resources, and supplies without considering what quantity and type of investments are actually needed to improve the health of the population. Fee-for-service mechanisms, used by most MAS in Botswana, pay providers for each diagnostic test, operation, or consultation they provide. Fee-for-service encourages providers to increase the provision of health services, but can also encourage the excessive use of unnecessary health

[2] Cited during meeting of the Health Financing Technical Working Group, Gaborone, February 2016.

services and inflate health costs. Other mechanisms, such as capitation, global budgets, or diagnosis-related groups (DRGs) have been effective at containing health costs while still incentivizing providers to deliver desired health outcomes. However, they can be more complex to implement and have their own unintended consequences. For example, capitation, which pays providers a pre-determined amount for each person registered to a facility or living in a geographical area, can encourage providers to reduce quality or refer patients to hospitals to save costs. Similarly, global budgets, which cap the total budget of each facility, can incentivize providers to refer the sickest patients to other facilities (Kutzin et al. 2016; Wang et al. 2012).

Many countries are using a combination of payment mechanisms to mitigate the disadvantages of each. One strategy is to adopt a fee-for-service mechanism in the initial stages of insurance reform to encourage providers to increase service provision, and then to transition to capitation, global budgets, or DRGs to limit spending and incentivize a more cost-effective use of resources (Kutzin et al. 2016). Ghana and Indonesia are using this approach; however, the implementation of output-based purchasing mechanisms in Botswana may first require substantial improvements in the country's health information and financial accounting systems.

4. CONCLUSIONS

This background paper has highlighted some of the likely factors that lead to inefficient spending in Botswana's health system. It provides examples of interventions that could support the GOB's ongoing efforts to improve efficiencies. While focusing on interventions within health financing, the brief also explores those in other areas of the health system, given their importance in addressing efficiency and achieving health system goals and the linkage between improved efficiency and health financing. This brief also shares ideas about large-scale reform that would shift Botswana's pathway towards UHC to one that holds promise for both improving efficiency and expanding access to the population. It is important to note that the incremental interventions and large-scale reforms are likely complementary, rather than substitutes for each other. The GOB is encouraged to consider these potential strategies, and the experiences other countries have had implementing them, as it continues strengthening the health system in Botswana.

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