

Final report



# Addressing efficiency and quality in Rwanda's health system



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## Executive Summary

The Rwanda Social Security Board (RSSB) has a critical role in Rwanda's healthcare system; to fulfill this role, it requires solid rules, analysis and provider compliance to ensure a functioning, efficient and quality healthcare system. As the major national payer, RSSB has considerable leverage over providers, and at the same time has responsibility for setting the rules and context for the overall healthcare system. This one-week consultancy has unearthed a few key issues regarding priority areas for action to promote greater efficiency and quality in the healthcare system, and identified topics for research to help RSSB reach its efficiency goals.

In addition, MINISANTE as a major healthcare provider has a robust agenda and has made great strides in establishing incentives for public providers. Those deserve support and encouragement – as well as evaluation to further strengthen performance and value in healthcare. Some possible areas for activities and research are also outlined.

### Improving Efficiency of RSSB Operations and Reimbursement

- **Adopting ICD-10 Codes.** The need to ensure a primary and secondary diagnosis for every patient served by RSSB is a backbone of RSSB responsibility to oversee spending and analyze impacts for policy and adjust incentives for providers. The adoption of the International Classification of Disease (ICD-10) to track diagnoses is the highest priority to allow effective management of RSSB funds.
- **Improving Tariff Setting.** This issue is tricky given competing perspectives and interests. The Health Insurance Council (HIC) sets prices through a multi-stakeholder tariff setting committee, but without the benefit of benchmarks, costs or reference prices. Better information would help the HIC address some system inefficiencies. Support for this process would strengthen the basis for tariffs.
- **Ensuring Information Technology for Management and Payment.** Progress on the development of Electronic Health Records (EHRs) and Health Information Management Systems (HIMSs) continues and there has been important attention to interoperability across providers, but neither allows for the tracking of provider behavior and performance, limiting RSSB's eventual ability to monitor, assess and incentivize providers. Annex 1 explains how information systems are ideally integrated and reinforcing.
- **Expanding Data Analysis and Research.** Exploiting claims data and analyzing patterns of use should be a key function of RSSB. It can inform many aspects of the insurance function and shed light on how services are being delivered, their efficiency and quality. As new data become available, the opportunity and necessity of using data for policy, programs, reimbursement and establishing incentives for providers emerges. Research is a key function that would help give RSSB the information it needs to adjust incentives as needed. Aspects of healthcare delivery also deserve attention to similarly inform RSSB policies and rules. The last section of this report outlines some ideas and examples for priority research.

- **Expanding RSSB Payment Arrangements.** The payment system is RSSB's principal management tool. Currently, RSSB reimburses providers on a fee-for-service (FFS) basis, meaning that it simply pays all submitted bills, which leads to higher volumes of care and higher costs. The lack of information on diagnoses (see first bullet) exacerbates the problem as RSSB has no knowledge of what specific services should be provided for the patients, and therefore has no basis for challenging bills. In future, RSSB can take advantage of alternative payment arrangements to reward and penalize providers to improve efficiency and encourage desirable behaviors. Annex 2 outlines key options.
- **Establishing a Separate Healthcare Delivery Program for Retirees and the Disabled.** The elderly and disabled consume far more healthcare services than the non-elderly population, and costs are commensurately higher (see Annex 3 for an analysis of the cost patterns in the US). The most effective cost containment model is "managed care", in which a given population is defined, and providers are paid on a "capitated" (per capita) basis (see Annex 1) and are responsible for delivering "integrated care", i.e., meeting the full range of healthcare needs for that population. The emphasis is on prevention, managing illnesses and preventing additional healthcare events, and avoiding costly treatments, emergency room visits and hospitalizations. The payment system offers providers an incentive to keep patients healthy and on lower cost treatments that maintain their health; the provider organization is incentivized to promote wellness as it is at risk for higher-cost treatments that result from inadequate care for patients. More details will be needed, but this outline summarizes the concept.
- **Supply of Medical Staff.** While staff, particularly doctors, have been in short supply historically, there is rapid growth of physician graduates, with the number increasing by almost 400 percent this year. Though physician costs today represent less than half of the cost of treatment of a given episode of illness, this figure is likely to grow, which will have implications for volume and therefore costs of healthcare. Though a longer-term issue, cognizance of the issue and planning accordingly would be prudent.

### Enhancing Public Service Delivery

MINISANTE has an impressive record and a forward-looking agenda that encompasses: EHRs, facility accreditation and management interventions, among other items. The suggested activities below address inefficiency in service provision, the costs of which are passed on to RSSB, and therefore are pertinent:

- **Enhancing Public Hospital Efficiency.** Frequent drug stock outs and back up purchases from retail outlets prove costly for RSSB and patients. Similarly, uneven performance in equipment repairs causes waste and reduces quality. Pilots can be used to test if alternative contracts with the private sector could reduce inefficiency and costs, and improve performance.
- **Public-Private Partnerships (PPPs) for Hospitals.** There are excellent examples of successful PPPs for hospitals that could serve to upgrade facilities and improve cost containment and patient satisfaction, particularly at high-end facilities like King Faisal Hospital. Much has to do with the structure, expectations, quality indicators and accountability of the management

firm under a PPP that could take over responsibility for the facility. This may be worth considering. Both Lesotho and Brazil have been successful in raising quality and efficiency in hospital care through PPP arrangements.

- **Government Incentives for Quality and Efficiency Improvements in the Private Sector.** Profit margins in the private healthcare sector are thin, but needs for upgrading and expansion exist. This is particularly true for nonprofit organizations. It might make sense to set up a fund for healthcare projects, with a competitive focus to ensure good investments as well as sensible requests. There is some evidence of sympathy for such investments, but little knowledge of the potential among the private providers. This could further bolster efforts to improve IT and quality, as loans/grants could be tied to measured improvements.

## Background and Context

This note results from a one-week consultancy for the Rwanda Social Security Board (RSSB), sponsored by the International Growth Centre. Both institutions have been incredibly helpful and supportive, and the ideas and conclusions, while preliminary, could not have been achieved without their input and the generous time of many individuals in the public and private sectors. The note summarizes some of the key issues behind the rising costs that RSSB is facing, and outlines some possible areas of consideration for intervention or research.

## Rising Healthcare Costs in RSSB

The spending spiral of 18 percent growth in healthcare spending is serious. It reflects a myriad of problems, some due to the nature of the economy, but others stem from the structure of the payment and delivery system; these are discussed below. Urbanization and household income growth lead to higher patient expectations and to higher healthcare costs. Estimates (and models) vary, but the elasticity of demand for healthcare with respect to higher national income generally exceeds 1.

Despite the cost increases, Rwanda has a highly functional healthcare system with features that serve the short and long term. Basing access on health insurance and ensuring co-payments are important, help to control overuse and give patients a stake in the process. The MINISANTE has a number of initiatives that should have a longer-term impact on costs and efficiency, including:

- Harnessing performance-based financing (PBF) to incentivize productivity;
- Designing and testing an Electronic Health Record (EHR) and Health Information Management System (HIMS);
- Promoting and ensuring quality of care through accreditation of facilities, establishing protocols for specific conditions, and other initiatives that engage providers and define performance and quality. These factors help to reduce waste (a major element in accreditation) and ensure that physicians do not decide on their own what to order in the way of tests and drug prescriptions;
- Emphasizing and supporting facility management, including ensuring that physicians do not manage funds and that financial managers are adequately trained; and,
- A commitment to making public hospitals function better.

These factors are important and rare in both low- and middle-income countries. Given the short visit, elements are undoubtedly missing from the above list, but efforts to date are impressive, broad and deserve follow-up.

The discussion below is divided into four major categories: 1) The state of standard sources of cost increases; 2) Rwanda healthcare-specific causes; 3) Proposed means for addressing these challenges; and 4) Possible studies, research and pilots to address the shortcomings and move RSSB forward.

## Standard Factors that Drive Healthcare Costs and their Relevance for Rwanda

Certain practices and conditions in the delivery and financing of healthcare frequently contribute to cost escalation: paying providers on a fee-for-services (FFS) basis, unrestricted access to all levels of care, rapid increases in the number of physicians, a shift in the disease burden toward chronic conditions and a rise in sicker patients, often driven by aging. Rwanda is grappling with four of these.

**Payment arrangements.** How providers are paid is the single most important tool of payers. All payments are currently FFS, that is, insurers pay the bills submitted and there are no incentives for performance. This arrangement leads to higher volumes of care and spending, and has no connection to outcomes. The payer carries all of the risk without the benefit of improved performance and outcomes. Alternative payment arrangements offer ways to control costs and reduce fraud, but the information system does not yet support ways to achieve those objectives. Information must be based on both the diagnosis and co-diagnosis, combined with better information on production within facilities (see below).

**Physician and Nurse Numbers.** A built-in phenomenon in healthcare is that supply creates demand, since it is physicians who create demand for healthcare on behalf of patients. The number of physicians in Rwanda currently is insufficient, and a gradual increase is likely warranted. However, according to the Medical Council, the historical number of physician graduates at the University of Rwanda (UoR) is about 100 per year. In a scale-up, that number will reach 379 in 2019. At the same time, three new medical schools are opening, and in the first year they together expect to graduate roughly 200 physicians. This means an anticipated 579 graduates, almost six times the normal number of physician graduates. Apparently, the UoR will reduce the number by 60 percent due to capacity constraints for maintaining quality. How many physicians are required is a function of resources as well as the model of service delivery. WHO currently has rules of thumb, but it is becoming clear in OECD countries that it is nurses, not physicians, whose numbers need to increase to address cost issues, and also to adopt new delivery modes that rely heavily on nurses as coordinators, managers and patient caregivers. Nursing numbers and training was not discussed during this visit, but is an issue for future discussion.

**Shift in disease burden.** As non-communicable diseases (NCDs) – the chronic, high-cost conditions that lead to expensive interventions (such as stroke, diabetes, heart attacks, dementia) – become more common in Rwanda having easy access to primary care services will be important. Patients' access to higher-level care is already limited, and that deserves to remain, but lower-levels of care probably do not need to be restricted. There is a need to enhance nursing care services to better address simple problems, another common efficiency and cost containment strategy.

**Rise of sicker patients.** The RSSB has responsibility for financing care for retirees who select to join the retiree health insurance program, and is also serving the disabled. Both of these

populations drive up costs as they are sicker and tend to suffer from multiple illnesses, many of which worsen other health problems. As the population ages, these costs will rise accordingly. A strategy now to control costs and address quality needs of this population would be a good investment for the medium and long terms.

## Sources of Cost Increases due to Rwanda's Health System Characteristics

The structure and evolving nature of the healthcare system and its financing account for some of the shortcomings identified here. However, as noted above, Rwanda has a solid base upon which to develop better and more effective arrangements for the financing and delivery of care. The following list summarizes some of the major issues, building on the topics above and developed further below within the context of solutions.

- It is unclear what RSSB is paying for, which raises costs, and the sources of high costs cannot be identified.
- The current payment system (FFS) encourages high volume of care.
- Lack of a clear, agreed diagnosis definition system undermines claims management and is a serious problem for oversight, reimbursement and accountability.
- IT is not fully exploited to inform billings, and the use of phone communication is underutilized, both of which could improve efficiency.
- In terms of fraud and abuse in claims, there is evidence of fraud: multiple claims for the same person and wrong test/over-prescription and unnecessary tests. There is inadequate information for RSSB to intervene effectively. Referral abuse is not evident but evidence is lacking.
- Rigidities in public hospitals inevitably lead to inefficiency and poor quality, which raise costs; some elements are particularly problematic such as supply chain and stock outs.
- There is no evidence that RSSB uses the financial power inherent in being the largest payer – no agreement on lower costs for inputs e.g., equipment, though bulk purchases of drugs may be providing savings.

## Addressing RSSBs Major Challenges and Directions for Change

This summary of possible solutions is divided into two sections: 1) the financing tools at RSSB's disposal to improve efficiency and control costs; and 2) suggestions on how to enhance aspects of service delivery. RSSB, as the largest payer, has clout with providers and can harness some effective incentives to move the system toward better efficiency, quality and cost containment.

### Harnessing Financing Tools to Drive Efficiency

**Establishing ICD-10 Codes for Diagnoses/Conditions.** Lack of a clear, agreed diagnosis definition system undermines claims management and is a serious problem for oversight, reimbursement and accountability. This issue is paramount and within the capacity of RSSB to address. Neither the public nor the private sectors in Rwanda understand what they are buying in healthcare. The world uses ICD-10 (International Classification of Disease-Round 10) codes to

determine what payers are purchasing. While there are literally thousands of conditions under the ICD-10, RSSB could rely on a subset of ICD-10 diagnoses. Providers would report the primary AND secondary diagnoses (or conditions), that together define the reason for and severity of the treatment. This allows reimbursement based on a set of defined and approved intervention(s). Furthermore, requiring providers to use protocols permits RSSB to compare actual behavior of providers with accepted and known benchmarks of intervention for the condition, which in turn allows assessing whether the tests conducted, the mix of staff used and the prescription(s) and subsequent treatment(s) are warranted. Without such information on diagnoses, bringing discipline to billings or holding providers accountable becomes difficult. Indeed, without a clearly defined reason for the care provided, bills cannot be interpreted properly and comparisons across providers – an important way to contain costs – are impossible.

**Setting Tariffs Requires Information.** Tariffs are currently set by the Medical Insurance Council. In OECD countries, prices are set based on information regarding various factors, including costs, and decided by government bodies or private sector billings. However, arguably the best approach is that of Germany, which appoints an independent body to set prices, something that is similar to the body in Rwanda. Combined with efforts to understand costs of providers, this approach reduces the role and influence of politics and special interests. The body can include government, private insurers and other stakeholders, but evidence and transparent criteria need to inform the basis for decisions.

This can be done through a combination of a cost study, analysis of claims (with clarity on the diagnosis) and comparisons with other countries. No country has adequate cost data because costing studies are expensive, but some sense of absolute and relative costs can help guide the proposed independent body. In addition, costs vary by level of facility and services provided. For example, district hospital and referral hospital costs differ, partly because the latter have higher overheads, more costly services and in-demand staff who require higher compensation. They also have higher diagnostic costs. These factors deserve attention in price setting efforts. As services become more sophisticated, having a policy in place on what and how to bring in new treatments will become important.

**Information Technology for Management and Payment.** The move toward better HIMS and EHR is critical and encouraging. However, there are some shortcomings that deserve attention. Missing are data on the expenditures and performance of the hospitals and clinics. Annex 1 summarizes the concepts and structures behind an integrated IT system. How much physicians spend on a specific patient and their decisions on tests, drugs and follow-up services are not available in the HIMS or EHR. Overtime, it will be important to track the practices of hospital departments and individual physicians in provider organizations, as they can be a source of major spending, and RSSB needs information to manage and guide the healthcare system toward both solid outcomes and cost containment. Similarly, some hospitals are more costly than others, but it is unclear why; similarly some physicians chronically order more and more expensive tests for the same condition. Details on the internal practices, decisions and the resource use implications are important for monitoring, planning, and adjusting policies and

rules for the delivery of care. These details also provide data to estimate the expenditure of services across physicians. Without such data, RSSB only has half of the needed information to manage the healthcare system and its costs.

**Expanding Data Analysis and Research.** Little data have been available to assess performance of RSSB and MINISANTE in terms of costs, spending or efficiency. The system is evolving and offers the opportunity to test new ideas, adapt good practices from elsewhere, and establish a robust research agenda to inform and guide RSSB and the health sector more generally. As new data become available from ICD-10 inclusion, the opportunity and necessity of using data for policy, programs, reimbursement and establishing incentives for providers becomes possible. Claims data from patient contact with providers form the backbone of research and provide key information to understand what is happening in the system. Research can systematically exploit the data to understand how the funds are being spent and how the system is performing in terms of procedures, utilization, efficiency and ultimately costs. MINISANTE has ongoing initiatives that could benefit from research and analysis to refine these programs, and it offers the opportunity to consider new directions through pilots. Suggested research ideas are outlined in the last section of this report.

**Designing a Separate Healthcare Program for Retirees and the Disabled.** Providing a separate arrangement for retirees and the disabled to contain costs would be a very useful payment and delivery model. Such a “managed care” arrangement would need to be designed for purpose and structured to meet the healthcare needs of these two populations. Both the elderly and the disabled use services more intensively than other segments of the population, and often utilize costlier services. Annex 2 summarizes the relationship among age-illness-costs in the US that also reflects the experience of all OECD and upper Middle Income Countries where infectious diseases have been replaced by non-communicable diseases (NCDs). Moreover, elderly and disabled populations suffer disproportionately from NCDs and chronic conditions that require close management to avoid complications (e.g., stroke, heart attacks, dementia). If their conditions are not managed and kept under control, costs climb quickly.

The concept would be to find a willing non-profit or for-profit entity to define a set of services and operating arrangements that meet the criteria of a closed organization that provides the specified services to the defined population, focusing on wellness and illness management: emphasizing nursing oversight and care, easy access, physical therapy, electronic communication with patients for oversight and to reduce use of more costly services (exercise and other activities to keep population mobile and self-sufficient could be added), and judicious use of palliative care. Giving advice/training to the family to keep the patient healthy and at home could be part of this pilot as well. The private provider payment arrangement could be through a negotiated capitated fee, with clear criteria on expectations, inputs and performance, tied to quality indicators for monitoring, or other accountable arrangement. The provider should be held accountable through penalties and/or rewards for inadequate/superior performance. This description is brief, but can be further developed to clarify and provide details.

**Payment System.** RSSB could complement FFS with other payment arrangements. Annex 3 summarizes the nature of these alternative payment arrangements. MINISANTE already uses a pay-for-performance tool to reward good performance of staff. Above, the use of capitation is suggested as a way to control the costs of retirees and the disabled. Case-based payments (Diagnostic Related Groups (DRGs)) can be useful for containing expensive or common diagnoses (such as deliveries), diagnoses that need continuous attention to avoid hospitalizations, or to control overuse of inputs or services. DRGs provide data that become a powerful management tool because managers know where funds are going. The advantage of DRGs or case-based payments is that providers are given a predetermined price for a basket of services for a given diagnosis for a given patient: If they are efficient, they keep the difference, but they must cover any inefficiency using other resources. This idea may be worth testing. As a first step, tracking costs by diagnosis could help identify where such payments might be most useful.

**Controlling Volume through Limits on Patient Interventions.** Even with protocols, which may not always be followed, some effort to constrain the total activities of a physician visit may be useful: For example, placing a ceiling on the number and types of tests allowed for common diagnoses, or requesting a second opinion for surgery or other costly interventions that may not be needed (something that may be less problematic now, but will grow with the sophistication of healthcare and the ability to offer more sophisticated tests and treatments).

### Enhancing Public Service Delivery

**Public Hospitals can be Made More Efficient.** Despite creative and valuable efforts on the part of MINISANTE, public healthcare delivery is inefficient. Drug stock outs are a major issue, and broken equipment, uneven staff attendance (not confirmed for Rwanda but common in public systems) and limited accountability are additional problems that create waste and inefficiency. The lack of authority for managers makes real accountability difficult. Engagement of the private sector in various areas may be useful in efforts to contain costs. For example:

- Use the private sector to distribute drugs and supplies, with government providing the oversight and holding suppliers accountable. The role of government in buying, storing and distributing drugs was necessary when drugs only arrived periodically by ship, but this is no longer the case. It is complicated and often awkward for government to buy, store and distribute drugs. Stock outs are an indicator of a problem. This approach would provide timely availability of inputs; avoids purchasing of retail-priced drugs during stock outs; exploits existing private sector distribution networks; allows holding the company that purchases, stores and distributes drugs accountable for performance; and offers the opportunity to negotiate lower prices for drugs given the volume of RSSB purchases. A pilot would provide more information, and a cost comparison of alternatives domestically or globally would be useful, too.
- Establish contracts for renting equipment and ensuring timely equipment repairs and maintenance. This could also be piloted to determine how best to arrange it.

- Undertake a cost comparison study of: renting major equipment and buying reagents vs. buying that equipment and purchasing reagents as needed. The current practice may actually be more costly than renting equipment and buying the reagents; it also places the need for access to inputs on the private provider. Again, like in drugs, private players have existing distribution channels to draw on, and a profit motive in getting reagents supplied when needed.
- Assess the performance based financing (PBF) and possible alternatives to update the approach, if warranted. Assess current quality improvement initiatives and consider new ways to incentivize or promote quality. Training, continuous support for new processes and other support for clinical providers and managers may be useful to consider in tandem with shifts in RSSB policy.
- Management and autonomy of managers and management is obviously important for improving efficiency as it provides managers the flexibility to marshal and deploy resource without restrictions. To the credit of the MINISANTE, it has multiple incentives in place to improve efficiency in delivery, but the rigidity of public sector rules makes management difficult. A useful step would be to examine how to effectively set up a public-private partnership (PPP) for King Faisal and possibly other hospitals. The experience of Lesotho is instructive, and Brazil's São Paulo state has successfully managed PPP hospitals for 25 years, delivering higher volume, lower cost, higher quality and consistently higher patient satisfaction than traditionally-managed public hospitals.

**Health Facility Management in Public and Private Sectors.** Despite efforts by MINISANTE, health facility management remains a problem, especially in the largest hospitals that are complex and require intensive management. King Faisal is a prominent example, but a private hospital assured us that they had no infections! More intensive training and professionalization of administration and management in general, but particularly for the more complex facilities, should be considered. If nothing else, this deserves discussion.

**Government Support for Infrastructure Investment in Healthcare.** Even efficient healthcare providers have narrow margins. Given the evolving nature of healthcare in the private sector, and the need to modernize equipment and spaces, providing low interest loans or having a grant fund for good ideas could stimulate new ideas and investments. Helping providers reach higher accreditation levels (associated with higher quality and less waste) or encouraging IT upgrades or other improvements are examples of investments that could have benefits to the system.

## **Possible Studies, Research and Pilots for RSSB Management and Oversight Functions**

Given the importance of the monitoring and research functions of RSSB, initiating analysis of data, studies of key elements of the healthcare system, research into efficiency and quality, and pilots that allow testing of new ways to deliver or pay for healthcare provide a solid evidence base for RSSB management of its healthcare responsibilities. These tools allow RSSB to know

what is happening in the healthcare system, and guides policy and programs to ensure desired outcomes. Table 1 provides examples. These deserve further discussion and consideration, but should offer a useful starting point.

**Table 1. Possible Studies, Research and Pilots**

Type of Research Activity	Examples of the Possible Initiatives or Contributions of Research Activities
Analysis of patient claims data (the backbone of continuous RSSB research)	<ul style="list-style-type: none"> <li>• Frequency of use analysis broken down by demographics and diagnoses</li> <li>• Comparison of utilization by diagnosis</li> <li>• Comparison of provider costs across diagnoses</li> <li>• Patterns of utilization across providers, geographic units, patient demographics</li> </ul>
Study of demand/health seeking behavior of patients	Survey of households to determine sequence of use across public and private sectors, average spending on healthcare, perceptions of quality
Costing study	Establishing relative costs, estimating inputs, benchmarking against other countries
Define a set of quality indicators for providers to ensure quality measures are considered in reimbursements	Review evidence from other countries and other quality initiatives with MINISANTE to assess and test a set 15-25 indicators that can be used across the system and enforced by RSSB
Assessment/design of Integrated Care Model for the Elderly	Outline of a design of a program for the elderly defining the key elements, roles and responsibilities of the management organization; second stage would provide templates and more detail on each aspect of the option
Case studies of payment arrangements for social insurance	Examples of application of payment arrangements and their impact; algorithms and other tools to guide policy and regulations
Pilot on outsourcing of pharmaceutical procurement, storage and distribution	Evaluation and comparison with public performance
Pilot on outsourcing equipment rental and/or maintenance	Evaluation and comparison with public performance
Review of Public-Private Partnerships (PPP) for hospitals	Summary of evidence on successful PPPs in hospital care – Experience is mixed, but well designed and managed PPP hospitals provide high value, and may be helpful to RSSB and MINISANTE
Assessment of private sector infrastructure and capacity	Interviews, and qualitative and quantitative surveys of the state of the private sector equipment, capacity and ability to meet the healthcare needs of the population currently and over the next decade.

## Conclusions

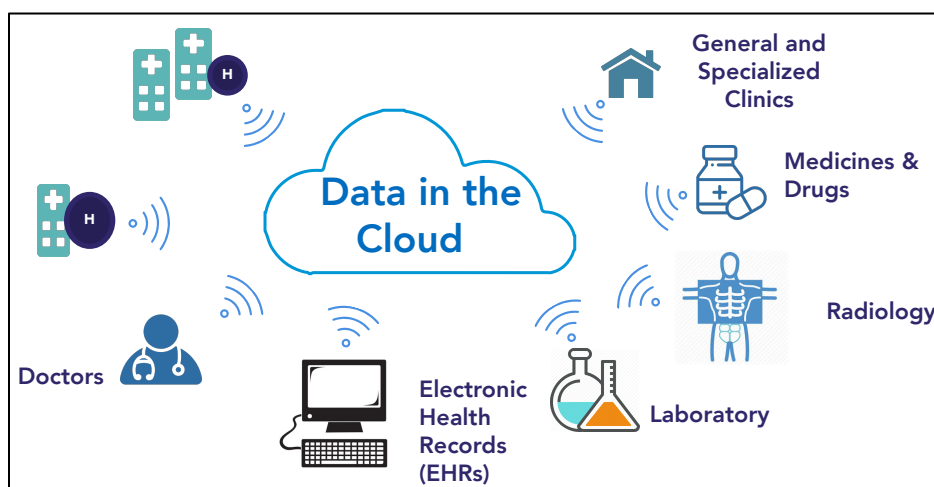
There are multiple areas for possible action and ways to improve RSSB performance, as well as that of public providers, and private providers to a lesser extent. The priority actions are a function of the appetite for and feasibility of making the changes proposed. The good news is Rwanda has a solid starting point and policies in place that make change easier. This review highlights areas of possible intervention and action, and can provide a base for moving forward.

## Annex 1: Health Information Systems

Health system restructuring to rein in costs, improve efficiency and raise performance and quality requires detailed data and information at all levels. Further, it requires that that data and information be readily available to policymakers, providers or patients, to use to make informed, evidence-based decisions. A robust health information system (HIS) is thus at the backbone of a well-functioning health system.

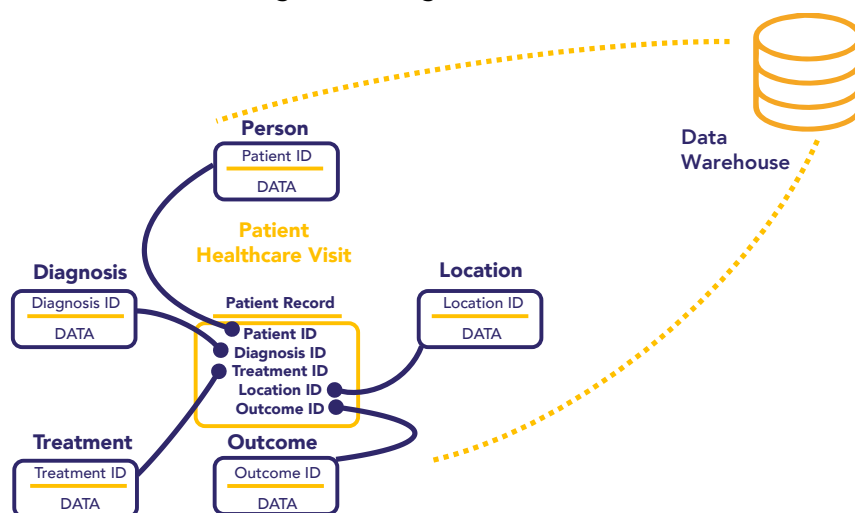
Ideally, such a system integrates data from all elements of the health system – patients’ electronic health records (EHRs), providers, labs/diagnostics, pharmacy, supply chain, etc. – and store it in a secure remote location, such as the cloud, as depicted in Figure 1. Data would ideally move beyond covering just what is done, for example what tests were ordered or what treatment prescribed, to look at *how* it is done, encompassing data on processes and performance. This is an important step for introducing pay-for-performance or value-based payment arrangements that require payers to have information on provider performance and patient outcomes.

**Figure 1: Data and Information about Processes, Performance, Exams and Patients – Available in the Cloud**



Such detailed, patient-specific and interaction-specific data requires a well thought-out data system architecture. As shown in Figure 2, it requires gathering data from each interaction between a patient and the health system, assigning unique identifiers to each piece of information and aggregating and storing that information in a useable way. Getting this architecture right from the start is important, so that a health system is not locked into an ill-suited design that is hard to undo.

Figure 2: Integration of Data



As discussed, generating data and transferring data through integrated information systems will be critical to all levels of the healthcare system. Payers need data to understand costs, process claims and hold providers accountable. Providers need data to make the best treatment decisions for patients and engage in proactive population health management. Data is necessary for smooth supply chains to avoid unforeseen stock outs of essential medicines and drugs. Labs and diagnostic facilities need information systems to rapidly send test results. Policymakers need data to inform policy directions and decisions. Finally, patients benefit from integrated data systems that allow data to follow them throughout the health system and to also help them become better managers of their own health and healthcare.

A fully integrated, cloud-based data system takes time to build. Yet, it is good to have an end vision in mind from the start, so that the system architecture can be designed and built accordingly.

## Annex 2: Summary of Alternative Payment Arrangements: Definitions and Issues in Implementation

Payment system	Definition	Issues
Pay for performance (P4P)	<ul style="list-style-type: none"> <li>Bonus or supplemental payments for hospitals, physician groups or health care teams that reward meeting defined performance standards; penalties for not meeting standards can also be imposed</li> </ul>	<ul style="list-style-type: none"> <li>Requires data to track activity, performance and outcomes</li> <li>Requires management to assess data, compare performances,</li> <li>administer rewards and penalties</li> </ul>
Global capitation with autonomy and accountability	<ul style="list-style-type: none"> <li>Fixed prospective capitated payment to an integrated care entity to cover all patient services for a defined population over a specified time period; capitated payment that can be adjusted for gender, age, income, location or disease burden</li> <li>Provider has autonomy in structuring and delivering services</li> <li>Provider is held to account for performance</li> </ul>	<ul style="list-style-type: none"> <li>Requires data to track activity, performance and outcomes</li> <li>Requires management to assess data, compare performances, administer rewards and penalties</li> <li>Performance and outcome goals defined in advance</li> </ul>
Global budgets with autonomy and accountability	<ul style="list-style-type: none"> <li>Fixed prospective payments paid annual or monthly to hospitals to cover full inpatient care for a defined population</li> <li>Provider has autonomy in structuring and delivering services</li> <li>Provider is held to account for performance</li> </ul>	<ul style="list-style-type: none"> <li>Requires data to track activity, performance and outcomes</li> <li>Requires management to assess data, compare performances, administer rewards and penalties</li> <li>Performance and outcome goals defined in advance</li> <li>Payer must be consistent in payment and policy across providers and over time</li> </ul>

Bundled payments	<ul style="list-style-type: none"> <li>• Predetermined, risk adjusted payment for full cost of treatment over the entire care cycle of a clinical episode, encompassing inpatient and outpatient services</li> <li>• Following of clinical protocols embedded in process</li> <li>• Provider is held to account for performance</li> </ul>	<ul style="list-style-type: none"> <li>• Need to define the full set of inpatient and outpatient needs and their cost to set price for the bundled services</li> <li>• Need to monitor the process to ensure compliance and make payments</li> </ul>
Shared savings	<ul style="list-style-type: none"> <li>• Payment in which provider or provider organizations share cost savings with the payer; savings are generated when actual spending for a defined population is below a target amount</li> <li>• Payers often provide assistance and funding to initiate efficiency improvement</li> </ul>	<ul style="list-style-type: none"> <li>• Requires data to track costs, and efficiency or savings</li> <li>• Requires management to assess data, and manage the allocation of savings</li> <li>• Often achieved by physician groups or health care teams with new delivery arrangements</li> </ul>
Diagnostic related groups (DRGs)	<ul style="list-style-type: none"> <li>• A “case rate” payment (i.e. all inpatient care associated with a particular condition or procedure) to hospitals based on expected cost of inpatient treatment</li> <li>• Pay hospitals predetermined amount for hospitalization for specific procedures based on primary and secondary diagnoses</li> </ul>	<ul style="list-style-type: none"> <li>• Complicated system for defining payment by diagnoses based on ICD-10 codes</li> <li>• Detailed data systems for tracking activity – also useful for monitoring provider activities</li> <li>• Provider data systems parallel payer systems</li> </ul>
Accountable Care Organizations (ACOs)	<ul style="list-style-type: none"> <li>• Joint organizational and payment arrangements</li> <li>• Payments (capitation, bundled payments, shared savings) based on the results health care organizations and health care professionals achieve for patients in their care network – managed high-risk illnesses (e.g., diabetes, asthma, COLD), reduced hospitalizations</li> </ul>	<ul style="list-style-type: none"> <li>• Requires data to track activity, performance and outcomes</li> <li>• Requires management to assess data, compare performances, administer rewards and penalties</li> <li>• Shared savings requires separate management</li> </ul>

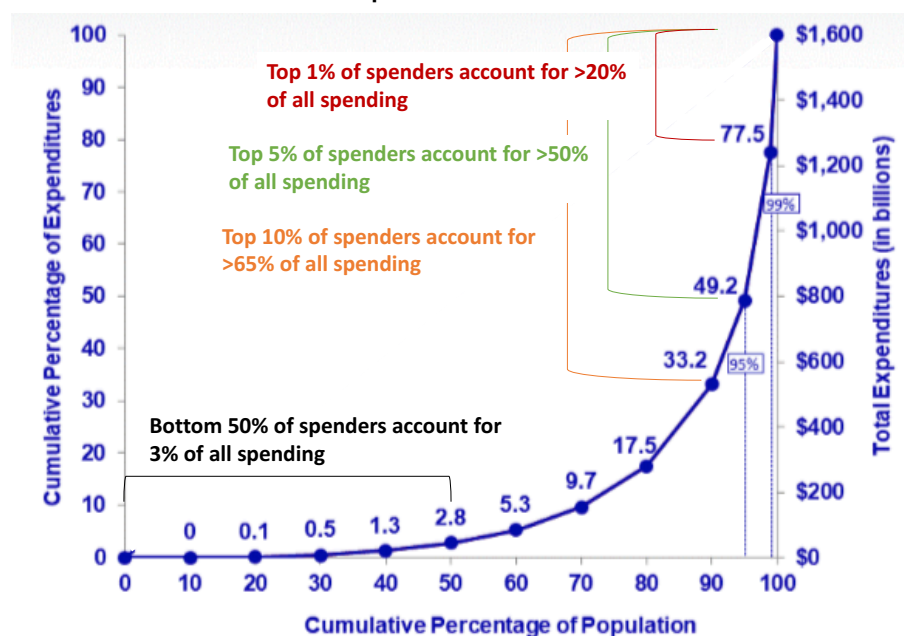
Sources: Berenson et al (2016) “A Typology of Payment Methods” *Catalyst for Payment Reform Research Report*. Urban Institute. Washington, D.C.; Langenbrunner et al (2009) *How-to Manuals: Designing and Implementing Health Care Provider Payment Systems*. Washington, D.C. World Bank.

## Annex 3: Distribution of Spending across National Populations – The Cost of NCDs

Globally, most countries are experiencing similar epidemiological and demographic transitions. Disease burdens are shifting from communicable diseases to chronic non-communicable diseases (NCDs), and populations are aging as lifespans increase and fertility rates decline. These shifts have significant implications for healthcare spending, including how spending is distributed across a population – implications that will be amplified as these trends accelerate, and can lead to cost spirals if not controlled.

Evidence from the US is illustrative. It shows that the vast majority of healthcare spending is concentrated among a small subset of the population, and this pattern is not new as it has been observed over decades. As shown in Figure 1, the population that makes up the top 1 percent of healthcare spenders accounts for over 20 percent of total healthcare spending, and the top 5 percent of spenders account for over 50 percent of total spending. In other words, over half of all annual healthcare expenditure in the US – equivalent to US\$800 billion – is incurred caring for just one-twentieth of the population. Interventions targeting this population can therefore have an outsized effect on total health expenditure. This pattern holds true in other countries as well.

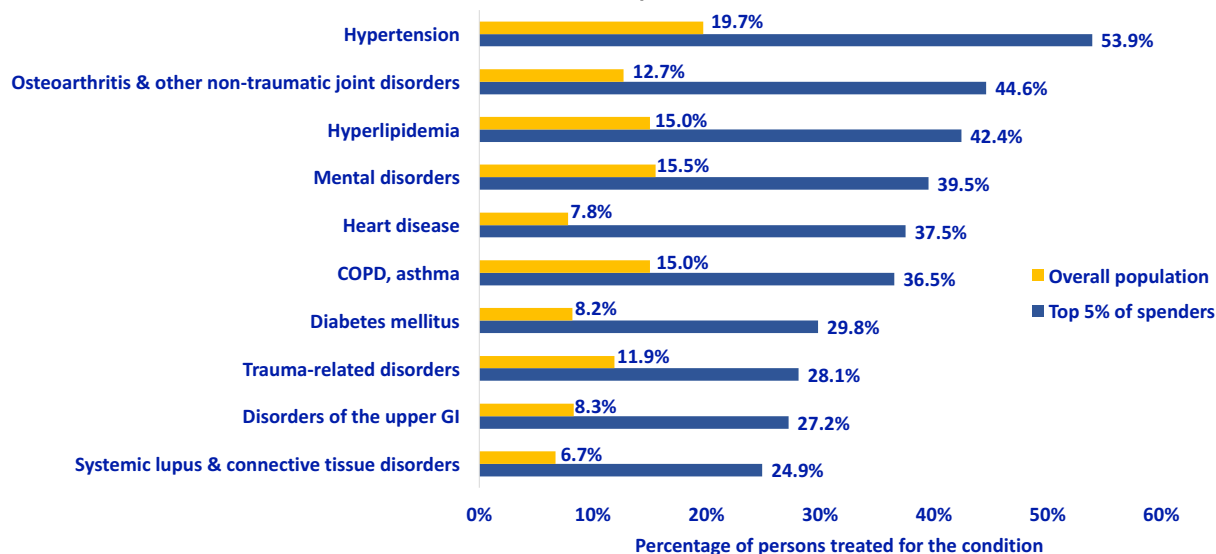
**Figure 1: Distribution of Healthcare Spending by Cumulative Percentage of the Population in the US, 2015**



Certain conditions are more prevalent among high-cost individuals. As depicted in Figure 2, in the US, NCDs such as hypertension, osteoarthritis/joint disorders, and diabetes mellitus affect one-third or more of the top 5 percent of spenders – much higher rates than among the general population. These conditions are chronic, usually requiring lifelong management, and can easily

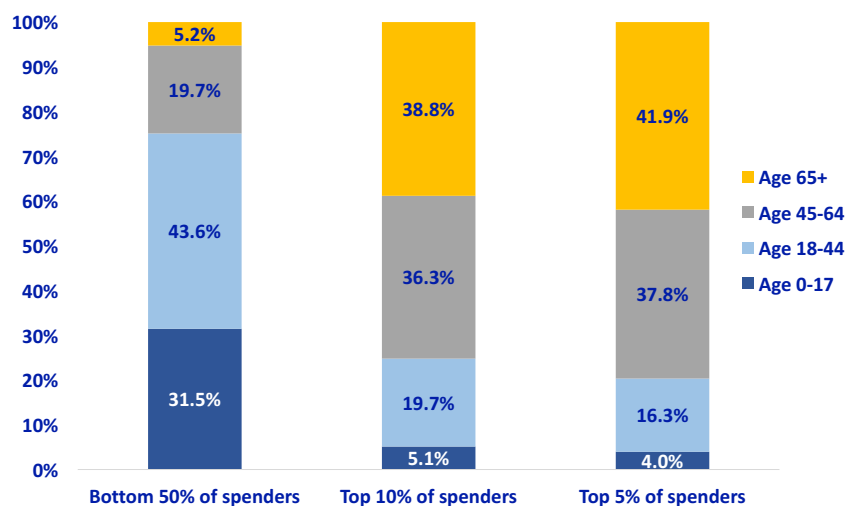
lead to costly hospitalizations if left uncontrolled. Further, many high-cost individuals suffer from multiple chronic conditions, resulting in even greater healthcare spending.

**Figure 2: Top 10 Most Commonly Treated Conditions among the Top 5% Of Healthcare Spenders in the US, 2015**



Additionally, as Figure 3 depicts, individuals in the top healthcare spending brackets are on average older than those in the lower brackets. Among the top 5% of spenders in the US, 42 percent are 65 years or older. The elderly tend to have more healthcare needs, including a higher prevalence of chronic NCDs, and thus generate higher healthcare costs.

**Figure 3: Age Distribution of Persons Treated by Healthcare Spending Percentile in the US, 2015**



The healthcare spending patterns illustrated above are not unique to the US. In most countries, a subset of high-need, high-cost patients – often the elderly and the disabled – account for a majority of healthcare spending. As NCD prevalence rises and populations age, this skew

becomes more pronounced. Creative policies targeting these populations, from disease prevention and control strategies to value-based payment mechanisms to new models of delivering care that look beyond doctors and hospitals, can help to rein in the costs incurred by this population segment.

Source: Mitchell E. & S. Machlin. 2017. Concentration of Health Expenditures and Selected Characteristics of High Spenders, U.S. Civilian Noninstitutionalized Population, 2015. *Statistical Brief #506*. Rockville, MD: Agency for Healthcare Research and Quality.  
[http://www.meps.ahrq.gov/mepsweb/data\\_files/publications/st506/stat506.pdf](http://www.meps.ahrq.gov/mepsweb/data_files/publications/st506/stat506.pdf)

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