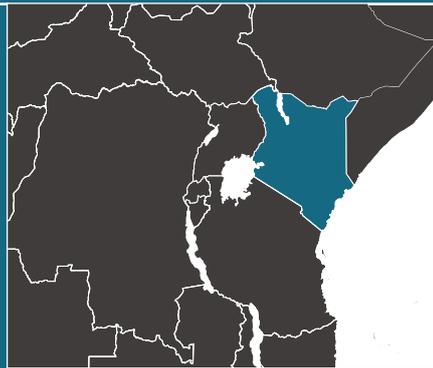


# policy

October 2014

## HEALTHCARE FINANCING OPTIONS FOR KENYA

FY 2013/14–2029/30



This publication was prepared by Julius Korir (consultant), Thomas Maina, Annie Chen, Nicole Perales, and Arin Dutta of the Health Policy Project.

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# Healthcare Financing Options for Kenya: FY 2013/14–2029/30

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**OCTOBER 2014**

This publication was prepared by Julius Korir (consultant), Thomas Maina, Annie Chen, Nicole Perales, and Arin Dutta of the Health Policy Project.

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# EXECUTIVE SUMMARY

## Background

Financing for healthcare in Kenya comes from various sources, including development partner contributions; the private sector, including out-of-pocket payments; and government of Kenya (GOK) tax revenue. Heavy reliance on out-of-pocket payments is undesirable. High healthcare costs can push vulnerable households below the poverty line. To expand and ensure widespread access to healthcare services and protect households from what are termed “catastrophic” health expenditures, Kenya needs alternative and sustainable healthcare financing mechanisms.

The USAID- and PEPFAR-funded Health Policy Project (HPP) supported the government of Kenya to analyze the long-term health delivery costs and health financing options available to the country. The results of this analysis will be used to ensure that adequate resources are mobilized in a sustainable way as the country moves toward universal health coverage. This report also provides additional evidence on universal health coverage for the consideration and action of the Interagency Coordination Committee’s Technical Working Group, an effort supported by HPP. The analysis covers fiscal years (FYs) 2013/14 to 2029/30 and includes a financing gap analysis.

The main objective of this study was to analyze the long-term, sustainable financing options available for healthcare in Kenya for FYs 2013/4–2029/30. The study team identified three research questions:

1. What are the costs of financing healthcare, assuming different epidemiological patterns, technological advancements, and their corresponding unit costs?
2. What are various sources of financing for healthcare in Kenya?
3. Based on a comparison of the resource need and resource availability, what are the additional financing options available for the health sector, especially drawing from domestic sources and innovative sources to bridge the gap?

## Methodology

The study adapted an HIV and AIDS–specific, macroeconomic framework developed by Oxford Policy Management, making it applicable for projecting resources for the entire health sector. The framework for the health financing analysis consisted of five modules: a macroeconomic module for estimating projected government tax revenues and public expenditure, and modules for estimating contributions from social health insurance, private health insurance, out-of-pocket expenditure, and development partner contributions. Data from a separate macroeconomic model for Kenya (KenDAS) were used to populate the modified Oxford Policy Management model.

The study also used OneHealth, a model applied to medium- to long-term (three to ten years) strategic planning in the health sector at the national level. The OneHealth model estimates the health impact achieved by using internationally approved epidemiological and impact models. It was applied in this study to generate cost estimates of delivering health services by disease program, incorporating implications for health systems components. Input costs for disease programs are based on the target population’s size, the percentage of population in need, and health service coverage based on proposed or existing national strategic plans.

## Scenarios

To estimate the gap in financing healthcare in Kenya, the study used the following fiscal space (resources available) scenarios in analysis:

1. **Base case:** The public health expenditure as a percentage of total government expenditures is assumed to be fixed at 5.9 percent from FY 2013/14 to FY 2029/30. National Health Insurance Fund (NHIF) projections are fixed at existing contribution schedules.

2. **Option 1:** The public health expenditure as a percentage of total government expenditures increases from FY 2013/14 to FY 2029/30, with a maximum of 10 percent. NHIF projections are fixed at existing contribution schedules.
3. **Option 2:** The public health expenditure as a percentage of total government expenditures increases from FY 2013/14 to FY 2029/30, with a maximum of 10 percent. NHIF projections are fixed at 1.5 percent of income for both employers and employees in the formal sector.
4. **Option 3:** The public health expenditure as a percentage of total government expenditures increases from FY 2013/14 to FY 2029/30, with a maximum of 10 percent. NHIF projections are fixed at 3 percent of income for both employers and employees in the formal and informal sectors.

In each of these fiscal space scenarios, out-of-pocket expenditure, private health insurance expenditure, and donor contribution projections are based on *National Health Accounts 2009/2010* estimates, projections, and growth rate.

Analysis with the OneHealth model used the following cost (resources required) scenarios:

1. **Business-as-usual:** The study team assumed that there would be no technological advancements or changes in the country's epidemiology from 2017 under this scenario. The country demographics were assumed to change from 2017 to 2030, based on projections from DemProj<sup>1</sup> demographic data.
2. **Optimistic:** The study team assumed that the health status of the population would improve and there would be technological advancements leading to reductions in the aggregate cost of drugs and commodities. The prevalence of non-communicable diseases was assumed to remain flat, while the prevalence of certain communicable diseases and malnutrition were assumed to decrease.
3. **Pessimistic:** The study team assumed the health status of the population would worsen, with Kenya's burden of non-communicable diseases increasing to the average levels seen in lower-middle income countries by 2020, and to those seen in upper-middle income countries by 2030. Under this scenario, the study maintained the prevalence of communicable diseases, while increasing drug resistance to anti-tuberculosis and HIV medications.

## Key Findings

### *Health financing resources available*

The scenario projections indicated that significant resources could be mobilized within the country to finance health services. The results showed that the **Base case** scenario would increase total resources from KSh 171 billion in FY 2013/14 to KSh 259 billion in FY 2029/30, using 2012 constant prices.

**Option 1** estimated that available resources would increase from about KSh 183 billion in FY 2013/14 to about KSh 385 billion in FY 2029/30, at 2012 constant prices. **Option 2** and **Option 3** showed that using a fixed rate of gross wages as the basis for calculating contributions would result in social health insurance having an enormous capacity to generate resources for healthcare financing (Figure 1).

In **Option 2**, estimated healthcare financing resources would rise from KSh 210 billion in FY 2013/14 to about KSh 469 billion in FY 2029/30 (2012 constant prices). In **Option 3**, resources would increase steadily from KSh 244 billion in FY 2013/14 to KSh 565 billion in FY 2029/30 at 2012 constant prices.

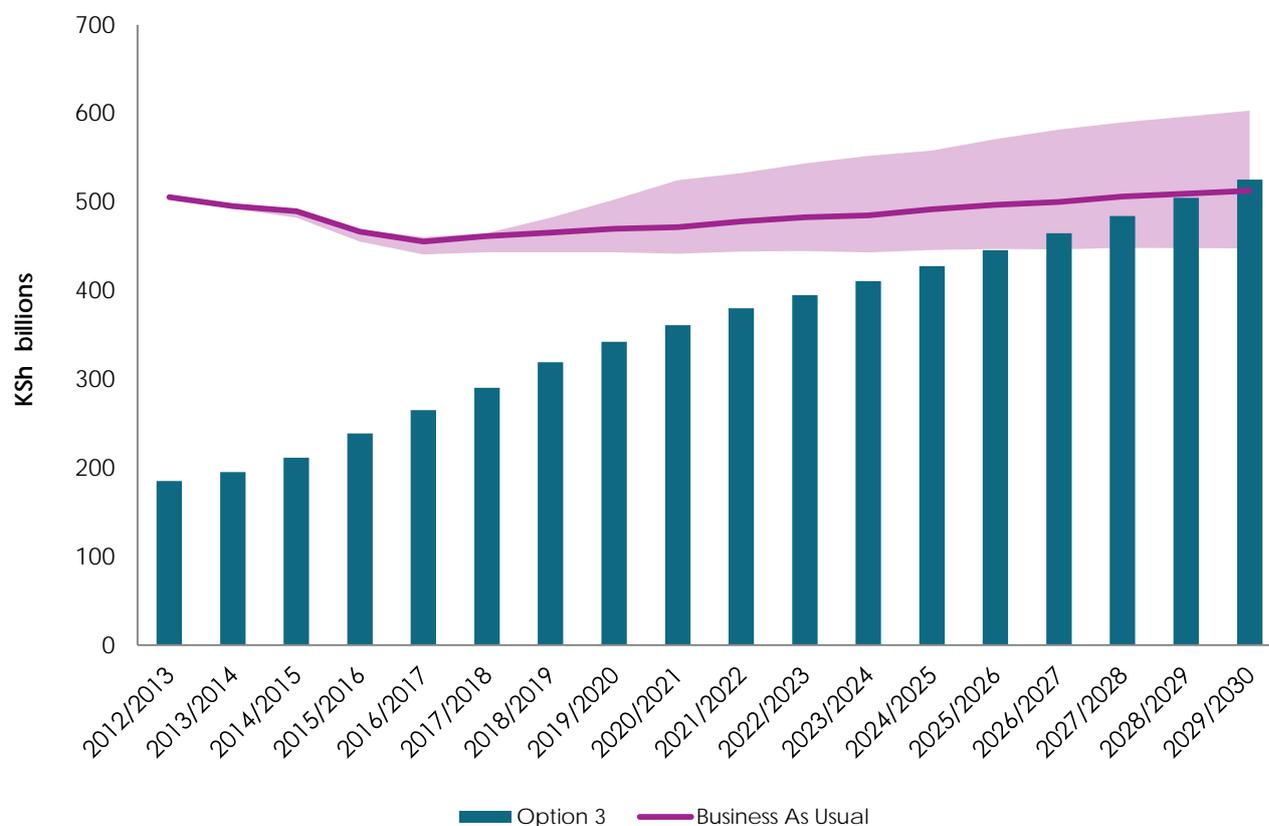
Under the **Base case** scenario, a total of KSh 4,076 billion could be raised during FYs 2013/14–2029/30. **Option 1** would raise an estimated KSh 5,138 billion. **Option 2**, with an increase in government expenditure on health and an increase in NHIF employee contributions, would result in

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<sup>1</sup> DemProj is the Demographic Projection (module), a part of the Spectrum suite of software. It enables default and customized demographic projections for the selected country, providing annual population estimates by age, along with births and deaths. It forms the basis for other epidemiological and health cost estimates in Spectrum.

an estimated KSh 5,776 billion. **Option 3**, with an increase in employee and employer NHIF contributions, could raise a total of KSh 6,624 billion.

**Figure 1. Gaps in Resources Under Option 3 (Resources Available) Against All Resources Required Scenarios, FYs 2013/14–2029/30 (including base FY 2012/13)**



Source: Authors

\*Unless otherwise indicated, all figures depict 2012 pricing

### Health service delivery costs

The **Business-as-usual scenario** projects that the cost of the health sector, including coverage across all sectors and the unmet need, will be KSh 518 billion by FY 2030. This represents a KSh 13 billion increase from the total cost in FY 2012. Over the same period, the proportion of the total cost supporting unmet need will decline from 51 percent to 34 percent of the total health sector cost. This decline will occur as coverage in the public and nonprofit sectors is scaled up, as anticipated by the third *Kenya Health Sector Strategic & Investment Plan* targets. HIV is the only program area for which the share of the total cost of the health sector will consistently increase from FY 2013/14 to FY 2029/30. The HIV program will make up 12 percent of the total health sector cost from FY 2012 to FY 2015, increasing to 17 percent from FY 2026 to FY 2030.

Under the **Optimistic scenario**, the total cost of the health sector will peak in FY 2012 at KSh 505 billion. Under this scenario, after FY 2016, the health sector will plateau, increasing by only KSh 9 billion over the following 14 years. Reductions in costs, due to technological advancements and the decreasing burden of communicable diseases, will almost completely outweigh the increasing cost due to population growth. As a result, the share of the health sector cost generated by service delivery (e.g., malaria and maternal, neonatal, and reproductive health programs) will fall in comparison to health system components, such as human resources. Over FYs 2012–2015, disease programs will constitute 75 percent of the total health sector cost but will fall to 72 percent by FYs 2026–2030.

The **Pessimistic scenario** projects a dramatic increase in the cost of the health sector following FY 2016. This projected increase is due to the rising prevalence of non-communicable diseases and drug resistance. If the proposed epidemiological shift occurs, the health sector will cost KSh 612 billion by FY 2030, a 33 percent increase from FY 2016. The contribution of non-communicable disease services to the total health sector cost will increase from 11 percent over FYs 2012–2016 to 18 percent over FYs 2026–2030, due to accelerated growth in service demand. Under this scenario, private sector coverage is high for non-communicable disease services. The cost of tuberculosis and HIV services will also rise, although less drastically, due to the higher cost of second-line treatments required for drug-resistant HIV and tuberculosis.

## Discussion

The study provides a broad view of Kenya’s viable, long-term healthcare financing options (FYs 2013/14–2029/30), with estimations of projected service delivery costs and required resources for financing healthcare services. The financing sources considered were taxes, social insurance, out-of-pocket payments, private health insurance, and development partner contributions. The analysis showed that internal resources could be a significant source of healthcare financing. Specifically, that enormous potential exists for Kenya to increase available domestic resources through social health insurance and tax revenue.

Based on the results, the study team recommends the following:

1. **Reform NHIF to provide full primary care coverage:** Raising NHIF contributions to a fixed percentage of employees’ gross wages, for both employer and employee contributions, will maximize revenue from social health insurance. The NHIF could represent a stable, predictable, and large financing stream for primary healthcare.
2. **Increase government expenditure as a financing source:** Raising the percentage of government expenditures on health in the overall government budget will help to bridge the financing gap. While the study considered only a modest increase to 10 percent, even this would mobilize a significant amount of resources.
3. **Improve efficiency in service delivery:** Shifting resources from more expensive tertiary hospitals to primary level facilities would reduce the costs associated with service delivery and reach more poor populations, and ensure that the country produces more healthcare outputs with its available resources.

## ABBREVIATIONS

AIDS	acquired immune deficiency syndrome
AIM	AIDS Impact Module
ART	antiretroviral treatment
FBO	faith-based organization
FY	fiscal year
GDP	gross domestic product
HIV	human immunodeficiency virus
HPP	Health Policy Project
IMF	International Monetary Fund
KEMSA	Kenya Medical Supplies Authority
KHSSP-III	<i>Kenya Health Sector Strategic &amp; Investment Plan, July 2014–June 2018</i>
KSh	Kenya shilling
NCD	non-communicable diseases
NGO	nongovernmental organization
NHA	National Health Accounts
NHIF	National Hospital Insurance Fund
OOP	out-of-pocket
OPM	Oxford Project Management
PEPFAR	U.S. President’s Emergency Plan for AIDS Relief
TB	tuberculosis
UK	United Kingdom
USAID	United States Agency for International Development
WHO	World Health Organization



# INTRODUCTION

## Context

International literature on health financing tends to group health financing systems according to the dominant source. For instance, systems could be classified as tax-based (e.g., Australia, Canada, Ireland, New Zealand, Sweden, and the UK), social health insurance, or private. However, the distinction is not always clear and no particular financing model is preferred by international health policymakers.

System approaches also vary from country to country. Some countries may even use a mixture of different contribution mechanisms. For example, in South Africa, parallel private and public systems exist. The public system serves the vast majority of the population, but is chronically underfunded and understaffed. The wealthiest 20 percent of the population uses the private system, which provides better services (Ataguba and Akazili, 2010).

In many of the poorest countries, some proportion of healthcare financing comes from development partners. These funds go to support essential health services that benefit the most vulnerable members of society, other designated programs, or general health schemes.

The USAID- and PEPFAR-funded Health Policy Project (HPP) supported the government of Kenya to analyze the long-term health delivery costs and financing options available in the country. This analysis was conducted to ensure that adequate resources are mobilized in a sustainable way as Kenya moves toward achieving universal health coverage. This report provides evidence on universal health coverage for consideration and action by the Interagency Coordination Committee on healthcare financing.

Universal healthcare (commonly known as national or public healthcare service) provides coverage for an entire population. These systems are predominantly financed through general taxation revenues. While they theoretically offer universal access, publicly financed systems often have to ration benefits, favoring those in greatest need. In many countries, employers provide some healthcare benefits to their employees and their families. Employer-provided healthcare services usually spring up where the state or social protection system does not guarantee access to an adequate quality of care (Cichon et al., 1999).

In many countries, especially middle-income countries, a significant share of healthcare financing originates from private or semi-public prepaid sources of revenue. These could include private or collective insurance arrangements or solidarity-based mutual societies. Various forms of patient co-payments (one form of out-of-pocket [OOP] payments) are found in almost all countries. People seeking services must make these co-payments, generally at the point of delivery. Individuals can help mitigate the risk of financial costs related to healthcare by setting aside savings to spend as health costs occur. However, even with the use of savings, health costs can impose a significant burden on households (Cichon et al., 1999).

In Kenya, the main sources of healthcare financing are OOP payments and donor funds (also referred to as development partner contributions). Donor funds account for 34.5 percent of the total health expenditure, while government funding accounts for 28.8 percent (MOMS and MOPHS, 2010). In FY 2009–2010, OOP payments amounted to 29.5 percent of total healthcare expenditure, while 7.2 percent came from other private sources. However, these OOP payments push about 1.48 million Kenyans below the poverty line each year (Chuma and Maina, 2012). In light of this, Kenya must consider alternative healthcare financing mechanisms that will ensure access to healthcare services while protecting households from the often catastrophic financial impacts of illness. Such mechanisms should largely depend on domestic resources if they are to be sustainable.

Kenya's development blueprint, *Vision 2030*, aims to move the country to middle-income status. Although this would be an important achievement for Kenya, middle-income countries rarely receive

support from donors, so achieving this target will have significant implications for the country's donor-dependent health sector.

## Objective

The main objective of this study was to analyze the long-term, sustainable financing options available for healthcare in Kenya. The study team identified three research questions for the period spanning FY 2013/14 to FY 2029/30:

1. What are the costs of financing healthcare, assuming different epidemiological patterns, technological advancements, and their corresponding unit costs?
2. What are various sources of healthcare financing in Kenya?
3. Based on a comparison of the resource need and resource availability, what are the additional financing options available for the health sector, especially domestic sources and innovative sources to bridge the gap?

## METHODOLOGY

This section, presents the analytical framework, data collection methods, and analytical plan

### Framework for Analysis of Health Financing in Kenya

Health resources in Kenya come from two broad sources: public and private. Public sources include the following:

- Government through general taxes (personal income tax, company tax, value-added tax, fuel tax, and import and excise duty)
- Loans from bilateral and multilateral agencies
- External grants (including charitable donations by foreign governments or organizations)
- Social insurance (mandatory insurance payments by employers and employees) (WHO, 2000; Mills and Ranson, 2001; Carrin and James, 2005)

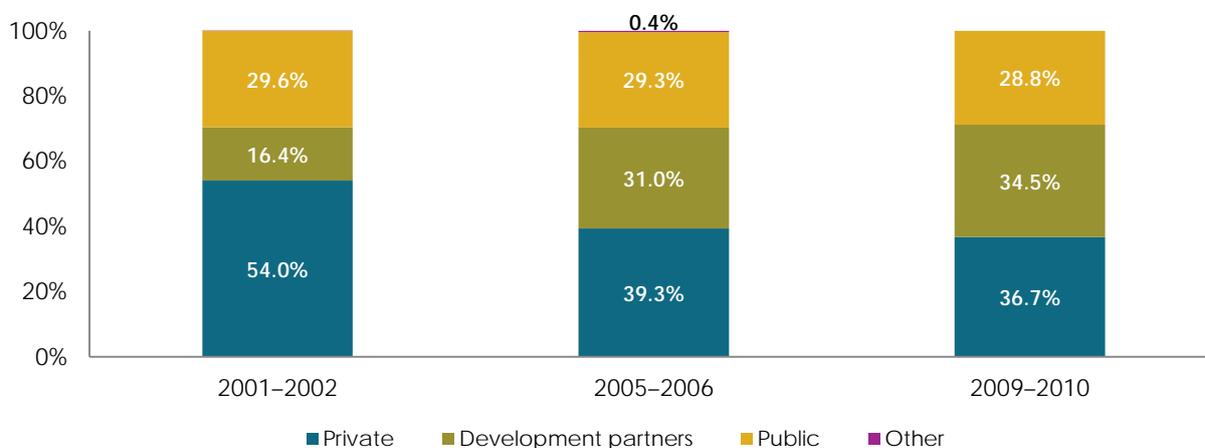
Donor funds (i.e., loans and grants) are channeled through general budget support (on-budget) and project support (off-budget). Off-budget funds form a substantial share of the total development partners' support (about 70%).

Private sources of funds include the following:

- Households (direct OOP payments by consumers to health providers)
- Employers (firms paying for or directly providing health services for their employees)
- Private, pre-paid health insurance plans (where households make voluntary payments to private health insurance companies in return for coverage of pre-specified health service costs)
- Donations (charitable contributions made in cash or in kind)
- Voluntary organizations or nongovernmental organizations (NGOs)

Figure 2 shows the percentage share of total health expenditure, specifically that public expenditure for financing healthcare in Kenya stayed constant at about 29 percent from FY 2001 to FY 2010, while donor funding increased from 16.4 to 34.5 percent. Household and other private sources' shares of healthcare financing consistently declined from 54 percent in FY 2001 to 36.7 percent in FY 2010.

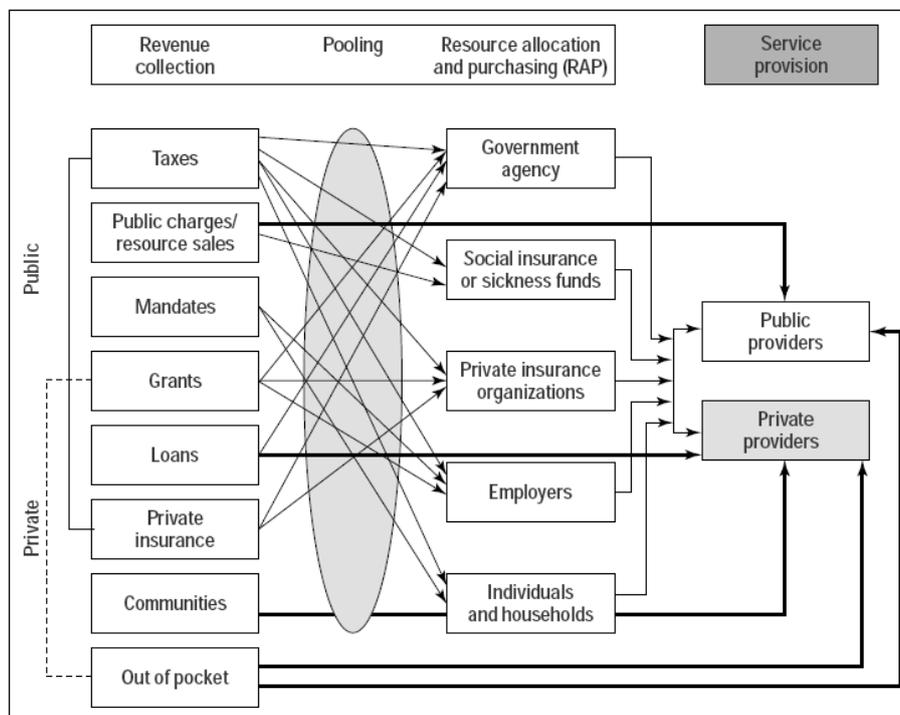
Figure 2. Sources of Healthcare Financing in Kenya



Source: National Health Accounts (MOMS, USAID, and Abt Associates Inc., 2002; GOK, Health Systems 2020 Project, 2009; MOMS and MOPHS, 2009); The World Bank, 2015

The main contribution mechanisms for any healthcare financing system include government tax revenues and loans, social health insurance contributions, private insurance contributions, and OOP expenditures. In a developing country context, donor contributions are also a major source of healthcare financing. This study considered all of these sources. Figure 3 summarizes healthcare financing functions, including revenue collection from different sources and the various pooling mechanisms used.

Figure 3: Healthcare Financing Functions



Source: Adopted from Scheiber et al., 2006

The analytical framework of this study comprised five separate modules: a macroeconomic framework for generating government tax revenues and expenditure; social health insurance estimates; private health insurance contribution estimates; OOP expenditure estimates; and donor contribution estimates. Each of these five modules is explained below.

### Macroeconomic framework

The macroeconomic framework was adapted from an Oxford Policy Management (OPM) model that projects sustainable financing for AIDS in Kenya, based on the country’s macroeconomic indicators. The standard format, as per the International Monetary Fund’s (IMF) Article IV surveillance activities, includes the following:

- Selected economic indicators containing summary data from the real, fiscal, monetary, and external sectors
- Fiscal operations of central government, describing the overall government budget and its financing
- Monetary accounts, showing the paths of net foreign assets and net domestic assets
- Balance of payments, including indicators on gross international reserves (NACC, 2012)

The OPM model was adapted and adjusted to make it applicable to the projection of resources for the health sector in general, rather than HIV response alone. Data from Kenya’s macroeconomic model (KendAS), developed by the IMF and the National Treasury, were used to populate the modified

OPM model. Then the framework was used to project tax revenues and total government expenditure. The total government expenditure formed the basis for estimating public health expenditures.

### ***Social health insurance modeling***

The International Labour Organisation's Social Budget Model was initially considered for use in projecting healthcare financing resources from social health insurance. However, it was found to be unsuitable because the projections required were long-term. Therefore a pragmatic approach, borrowed from the OPM study, was adopted. In this approach, population projections were used to estimate the size of the workforce and employment levels in Kenya's formal and informal sectors. The projected number of employees in the two sectors was combined with the National Health Insurance Fund (NHIF) contribution rates to estimate social health insurance contributions. For more information about social health insurance modeling, refer to Annex 1.

### ***Out-of-pocket modeling***

The team used the adapted macroeconomic model to project OOP expenditure, where the approach for measuring gross domestic product (GDP) was also used to estimate total consumption expenditure on goods and services. In this study, the OOP contribution from the *National Health Accounts (NHA) 2009/10* was the basis for the projections. The OOP expenditure as a percentage of consumption was then applied to project OOP spending. For more information about OOP modeling, refer to Annex 1.

### ***Private health insurance modeling***

Private health insurance in Kenya has been largely stagnant, covering only 2 percent of the population. The projections were made with the assumption that private health insurance coverage will remain almost constant as social health insurance expands. However, the model was adjusted for the change in price level over FYs 2013/14–2029/30 using the GDP deflator (i.e., price level measure of all new, domestically produced, final goods and services). For more information about private health insurance modeling, refer to Annex 1.

### ***Development partner contribution modeling***

For the development partner contribution model, partner contributions were increased slightly from FY 2013/14 to FY 2017/18 and then progressively and modestly lowered for the remaining years. The decline was derived by linking donor support and level of per capita income in the country, beginning in FY 2010. The macroeconomic model projected that Kenya will achieve middle-income country status by FY 2017/18, at which point donor support may begin to decline. For more information about development partner contribution modeling, refer to Annex 1.

### ***Data sources for healthcare financing analysis***

Data for populating the different components of healthcare financing in the framework were obtained from various sources, including the National Treasury, NHIF, donors, the Association of Kenya Insurers, the Ministry of Health, and the Kenya National Bureau of Statistics. In addition, secondary data were extracted from the NHA data for FYs 2001/02, 2005/06, and 2009/10, including current GDP, projected GDP growth rates, the GDP deflator, public revenues and expenditure, population projections, the number of NHIF contributors, NHIF contribution rates, OOP expenditure, private consumption expenditure, donor contributions, donor grants to the government, and government budget deficit financing. For more information about the healthcare financing analysis, refer to Annex 1.

### ***Data analysis***

An Excel-based model was developed to project resources from different sources. The model comprised the five modules indicated above. FY 2011/12 was used as the base year and projections were made from FY 2013/14 to FY 2029/30. Data collected from the sources noted above were used to populate the model.

### **Scenarios for healthcare financing**

The healthcare financing or fiscal space analysis has four scenarios: the Base case scenario, Option 1, Option 2, and Option 3. For each scenario, OOP expenditure, private health insurance expenditure, and donor contribution projections were based on *NHA 2009/2010* estimates, projections, and growth rate.

In the **Base case scenario**, the public health expenditure, as a percentage of total expenditures, is assumed to be fixed at 5.9 percent from FY 2013/14 to FY 2029/30. NHIF projections are fixed at existing contribution schedules.

In the **Option 1 scenario**, the public health expenditure, as a percentage of total expenditures, is an increasing proportion of public health expenditure as a percent of total government expenditure from FY 2013/14 to FY 2029/30, with a maximum of 10 percent. NHIF projections are fixed at current (2013) contribution schedules.

In the **Option 2 scenario**, the public health expenditure, as a percentage of total expenditures, is an increasing proportion of public health expenditure as a percent of total government expenditure from FY 2013/14 to FY 2029/30, with a maximum of 10 percent. The NHIF projections are fixed at 1.5 percent of income for both employers and employees in the formal and informal sectors.

In the **Option 3 scenario**, the public health expenditure, as a percentage of total expenditures, is an increasing proportion of public health expenditure as a percent of total government expenditure from FY 2013/14 to FY 2029/30, with a maximum of 10 percent. The NHIF projections are fixed at 3 percent of income for both employers and employees in the formal and informal sectors.

## **Analysis of Costs of Healthcare Delivery in Kenya**

### **OneHealth methodology**

In 2012, Kenya's two ministries of health chose the OneHealth Tool (Box 1), which uses a systemic modular approach, to estimate the cost of the health system. OneHealth's approach incorporates a country's national disease programs and health system building blocks to project estimated costs. Developed by Avenir Health (formerly Futures Institute) and collaborating international agencies, the primary purpose of the OneHealth tool is, "to assess public health investment needs in low and middle income countries ... [giving] planners ... a single framework for planning, costing, impact analysis, budgeting and financing of strategies for all major disease and health system components" (UN, 2011).

The model considers the demands of the health system using a comprehensive approach, from both system-wide and program-specific perspectives. Further, the model, "incorporates planning and costing of all the health system building blocks: human resources, facilities, equipment and transportation, medicines and supply chains, health management information systems, monitoring and evaluation, governance activities such as policy and advocacy, and activities related to financing and administration" (UN, 2011).

#### **Box 1. What is OneHealth?**

The OneHealth model is a tool for medium- to long-term (3 to 10 years) strategic planning in the health sector at the national level. Produced by an international consortium in collaboration with the World Health Organization (WHO), other United Nations agencies, and Avenir Health (formerly Futures Institute), the OneHealth model estimates cost of health service delivery by disease program with incorporating implications for health systems components. Input costs for disease programs are based on the target population's size, the percentage of the population in need, and the proposed coverage based off of proposed or existing national strategic plans.

### **Baseline epidemiology and demographics**

OneHealth estimates the health impacts achieved by using internationally approved epidemiological and impact models. One such model, DemProj, projects the population size for an entire country or region by age and sex, based on assumptions about fertility, mortality, and migration. OneHealth projections served as the baseline demographic data for all analyses in this study.

Epidemiological data were used to determine the population in need of various health services. These data were derived from consultation with the GOK ministries and technical partners and from an extensive literature review. The consultation was facilitated by the use of data collection sheets, which are described in detail in the next section.

### **Data sources**

During the development of the third *Kenya Health Sector Strategic & Investment Plan (KHSSP-III)*, USAID requested that HPP provide technical assistance in costing Kenya's public health sector services. This technical assistance also served as the basis for the long-term cost projection for the health sector. From 2012 to 2013, the study team worked with the two ministries of health, and their respective departments and divisions, to determine the *KHSSP-III* scale-up plans, commodities required for scale-up, unit costs, and other aspects of service delivery.

Data collection for OneHealth was supported by a Nairobi-based economist, two junior economists, and a senior clinician from the ministries of health. A first round of costing results was produced in late August 2012. The results for several disease programs were shared with the technical experts from the ministries of health in September. Ongoing validation of the results occurred from 2012 to 2013.

To analyze the long-term cost of the health sector, the study team expanded the *KHSSP-III* cost projection in the following ways:

- Extended the timeline from FYs 2013/14–2016/17 to FYs 2013/14–2029/30
- Included the for-profit sector
- Estimated the cost of unmet need in the health sector from FY 2012/13 to FY 2029/30

To extend the *KHSSP-III*'s end year from FY 2016/17 to FY 2029/30, in May 2013 the study team developed three scenarios which centered on projected epidemiological patterns and technological advancements. The assumptions which shaped the cost of service delivery in the scenarios were based on expert opinions and a literature review; they are discussed in detail below. Costing for FYs 2013/14–2029/30 goes beyond the public and nonprofit (faith-based organization [FBO] and NGO) sectors under the *KHSSP-III*, to include the cost of service delivery in the for-profit sector and the estimated unmet need in the health sector.

### **Unit costs of service delivery and program management costs**

Service delivery within the *KHSSP-III* was defined based on the revised Kenya Essential Package for Health, incorporating almost 350 interventions across promotive, preventive, curative, palliative, and rehabilitative care. Program management costs incurred by the responsible department—training, supervision, monitoring and evaluation, transportation, advocacy, and communication media and outreach—were incorporated into the cost of service delivery at the program level.

OneHealth follows the WHO's Health Systems Framework. The six building blocks of the framework include: health workforce, health financing, medicine and health products, health information, governance, and service delivery. Service delivery is fully costed in the OneHealth cost analysis of disease programs. The remaining blocks are captured in other OneHealth health system components: human resources, governance, infrastructure, logistics, information systems, and financing.

The cost components for OneHealth include the cost of infrastructure and equipment; human resource costs; logistics costs, which encompass the cost of drugs and commodities; Kenya Medical Supplies

Authority (KEMSA) storage; transportation; national-level administration, governance, and leadership costs; costs for health financing policies; and costs for the health information system.

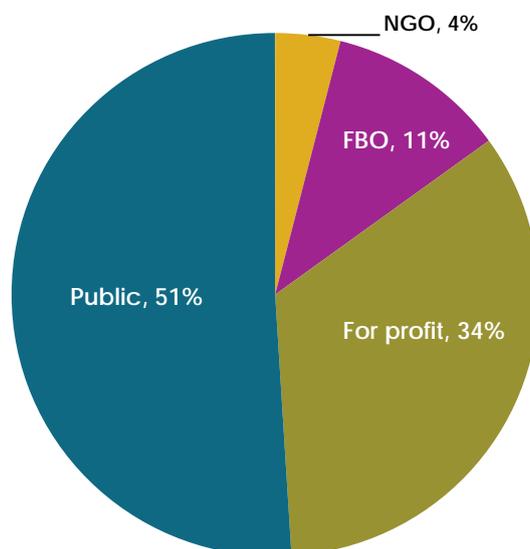
For all disease programs, customized data collection sheets were designed around the OneHealth inputs to synthesize all primary and secondary data. The health sector analysis assumed the cost of drugs and commodities required for services in the public and nonprofit NGO/FBO sector was equal to that of the for-profit sector.

For more detailed information on the OneHealth system component costs, see Annex 2.

### ***Coverage across the public, nonprofit NGO/FBO, and for-profit sectors***

As shown in Figure 4, the public sector oversees 51 percent of the 7,795 health facilities in Kenya, followed by the for-profit sector (34%), NGOs (4%), and FBOs (11%) (GOK, 2009). The public sector also operates most hospitals and dispensaries. The for-profit sector generally “operates hospitals, nursing homes and maternity facilities catering to higher income clientele” (Bliss, n.d.). For more information about public health centers, NGO/FBO nonprofit health centers, and for-profit health centers in Kenya, see Annex 2.

Figure 4. Kenya’s Health Facilities by Sector, 2011



Source: GOK, 2009

### ***Unmet need***

In this analysis, “unmet need,” is defined as the gap between the need and the coverage of services in the health sector. Cost to meet the unmet need only accounts for the increased amounts of drugs and commodities needed to provide those health services. There was a lack of data on how program support costs may increase as the unmet need is reduced, so they were not increased. The study team also assumed that public sector program costs would increase the efficiency of how services under the nonprofit sector are managed. The first step was estimating the cost of covering 100 percent of the disease burden, or “total need,” as defined by epidemiological indicators. The difference between the cost of the total need and the projected services covered in the nonprofit and for-profit sectors yields the cost of the unmet need (Figure 5).

Figure 5. Unmet Need Methodology



Source: Authors

### **OneHealth analysis**

A number of variables may shape the future of Kenya’s health sector, ranging from political will to climate change. For this analysis, the study team focused on epidemiological profile and commodity prices.

Both variables are shaped by current efforts within the health sector and have a large evidence base to reasonably inform long-term projections. The future burden of communicable disease, for example, is largely determined by current preventive efforts. Similarly, technological advancements can quickly lead to real reductions in service delivery costs. Based on the above-mentioned variables, the study team created three scenarios for the future of Kenya’s health sector: Business-as-usual, Optimistic, and Pessimistic. To isolate the effect of each scenario on the cost of the health sector, all three scenarios assumed flat public, nonprofit NGO/FBO, and for-profit coverage of services from FY 2017 to FY 2030.

#### *Business-as-usual scenario*

The Business-as-usual scenario assumed no technological advancements or changes in the country’s epidemiology (the same need for interventions) from FY 2017 to FY 2030. The only year-to-year variable over this period was country demographics which were determined by DemProj for all three scenarios.

#### *Optimistic scenario*

The Optimistic scenario assumed an improvement in the health status of the population (reduced need for interventions). The study team assumed that the prevalence of non-communicable diseases (NCDs) will remain flat, while the prevalence of certain communicable diseases and malnutrition will decrease:

- Prevalence of postpartum maternal and newborn sepsis, childhood diarrhea, childhood pneumonia, and childhood malaria will decrease by 50 percent
- Prevalence of adult malaria and women with low body mass index, and the need for preventive malaria interventions will decrease by 25 percent
- Prevalence of severe and moderate acute malnutrition will decrease by 33 percent
- Need for micronutrients supplementation will decrease by 10 percent

The Optimistic scenario also assumed that technological advancements would lead to a reduction in the cost of drugs and commodities. The study team assumed drug cost reductions will be greatest for drugs to treat NCDs, neglected tropical diseases, and those used in emergency health services.

#### *Pessimistic scenario*

The Pessimistic scenario assumed the health status of the population would worsen (increased need for interventions). The study team maintained the prevalence of communicable diseases, while increasing the burden of certain NCDs and drug resistance to anti-tuberculosis (TB) and anti-HIV medications. Although this is labeled a “pessimistic” scenario, current literature confirms the probability of such epidemiological trends (Boutayeb and Boutayeb, 2005; WHO, 2010).

Based on current literature, the study team estimated an increasing burden of NCDs. In fact, the literature shows that by FY 2020 the burden of NCDs in developing countries may reach levels similar to those currently seen in lower-middle income countries (Boutayeb and Boutayeb, 2005). Likewise, as Kenya continues to develop and citizens' lifestyles change, NCD trends could match those observed in upper-middle income countries (Boutayeb and Boutayeb, 2005). Based on these and other projections, the study team assumed prevalence rates of diabetes, cancer, cardiovascular disease, and respiratory disease in Kenya would reach those of lower-middle income countries by FY 2020, and of upper-middle income countries by FY 2030 (WHO, 2010; Mackay and Mensah, 2004). Specifically, respiratory conditions were projected to increase by 25 percent and cancer caseloads by 50 percent by FY 2030, additionally, the Diabetes Type II caseload was projected to be three times higher, high cholesterol caseload 15 times higher, and high blood pressure caseload five times higher.

## RESULTS

The results of the analysis are presented in accordance with the study’s objectives. First, we present the results of the analysis and projections of financial resources for FYs 2013/14–2029/30. For more detail on these projections, see Annex 1. Second, the costs of healthcare services results are discussed. Additional information on long-term healthcare costs is presented in Annex 3. Third, the financing gap results are presented and discussed.

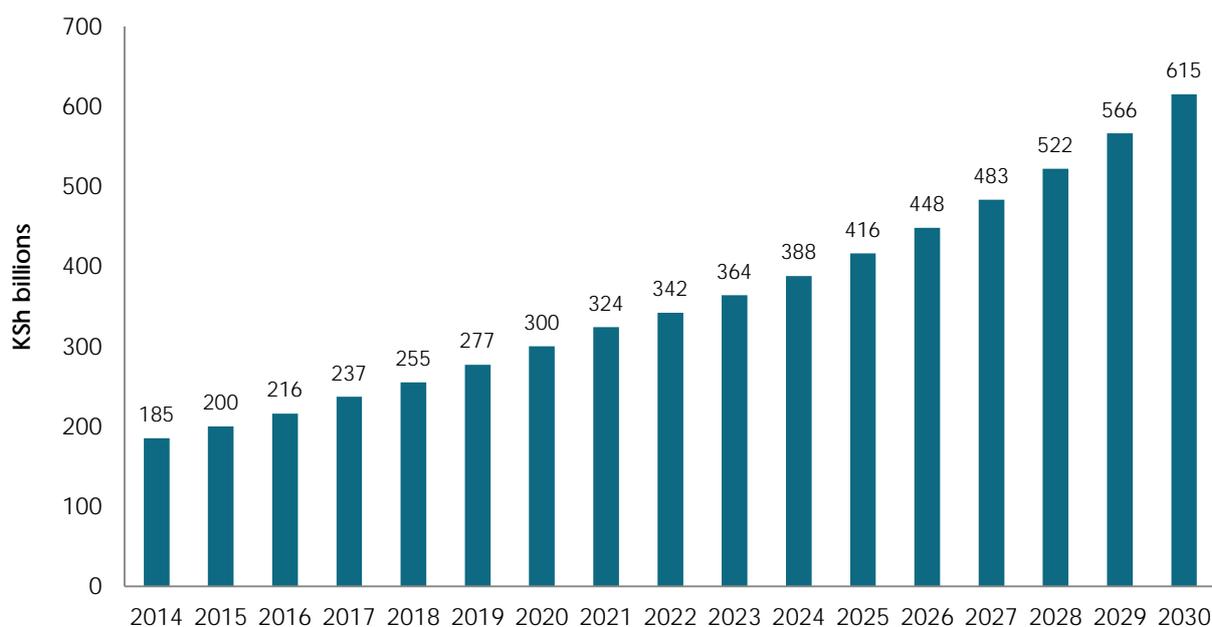
### Long-term Healthcare Financing Projections

The study estimated resources that could be mobilized from taxes, social health insurance, OOP payments, voluntary private health insurance, and development partners between FY 2013/14 and FY 2029/30.

#### *Base case scenario*

Figure 2 shows the total estimated health financing resources under the Base case scenario. Under this scenario, taxes will continue to be the main source of financing in Kenya if full social insurance is not implemented. OOP and social health insurance will follow taxes as the leading sources of financing.

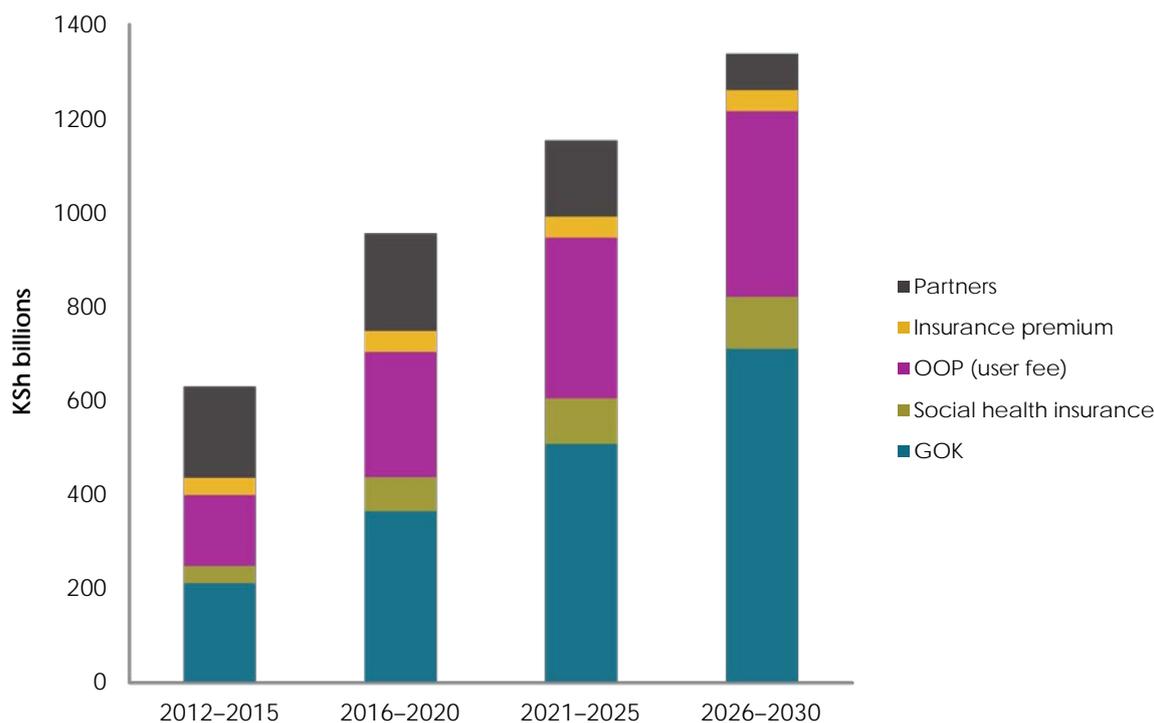
Figure 6. Total Estimated Health Financing Resources, FYs 2014–2030



Source: Authors

Figure 7 presents additional results of the Base case scenario. Assumptions for the Base case scenario were: current status of NHIF contributions, public health expenditure of 5.9 percent for all years, private health insurance growth by consumer price index rate, and slightly declining OOP as a percentage of total consumer expenditure. Partner sources were assumed to increase until FY 2021 and decline as the country moves to upper-middle income status. As shown in Figure 7, total financial resources under the Base case scenario will increase from KSh 630 billion in FYs 2012–2015 to KSh 955 billion in FYs 2016–2020, KSh 1,153 billion in FYs 2021–2025, and KSh 1,338 billion in FYs 2026–2030.

**Figure 7. Health Financing by Contribution Type, Base Case Scenario, FYs 2013/14–2029/30 (including base FY 2012)**

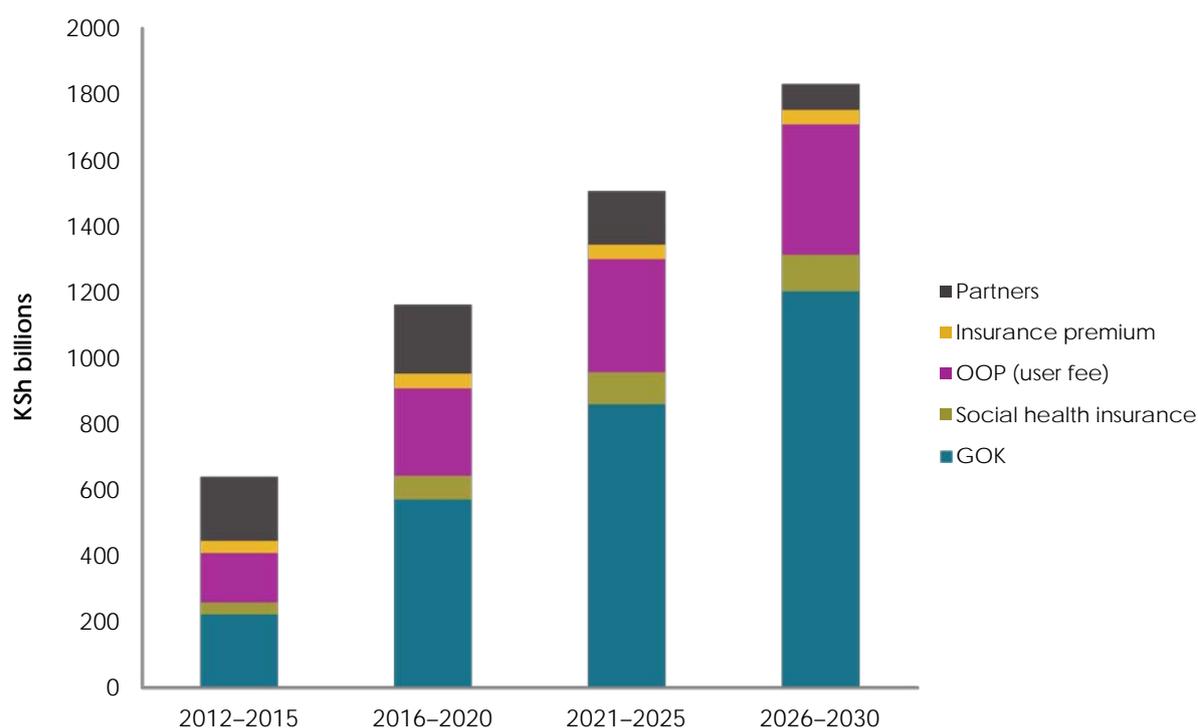


Source: Authors

### Option 1 scenario

The assumptions for the Option 1 scenario were current status of NHIF contributions and a steady increase in public health expenditure (from 5.9% in FY 2011/12 to a maximum of 10% of total government expenditures by FY 2017/18, and at 10% up to FY 2029/30). Under Option 1, private health insurance, OOP, and partners' contributions remain at the base level values for the period under consideration. The estimated total from these sources will increase from KSh 640 billion in FYs 2012–2015 to KSh 1,161 billion in FYs 2016–2020, KSh 1,506 billion in FYs 2021–2025, and KSh 1,830 billion in FYs 2026–2030. The total amount for the entire period under this scenario represents an increase of 26 percent of the resources, as compared to the Base case scenario (Figure 8).

**Figure 8. Health Financing by Contribution Type, Option 1 Scenario, FYs 2013/14–2029/30 (including base FY 2012)**

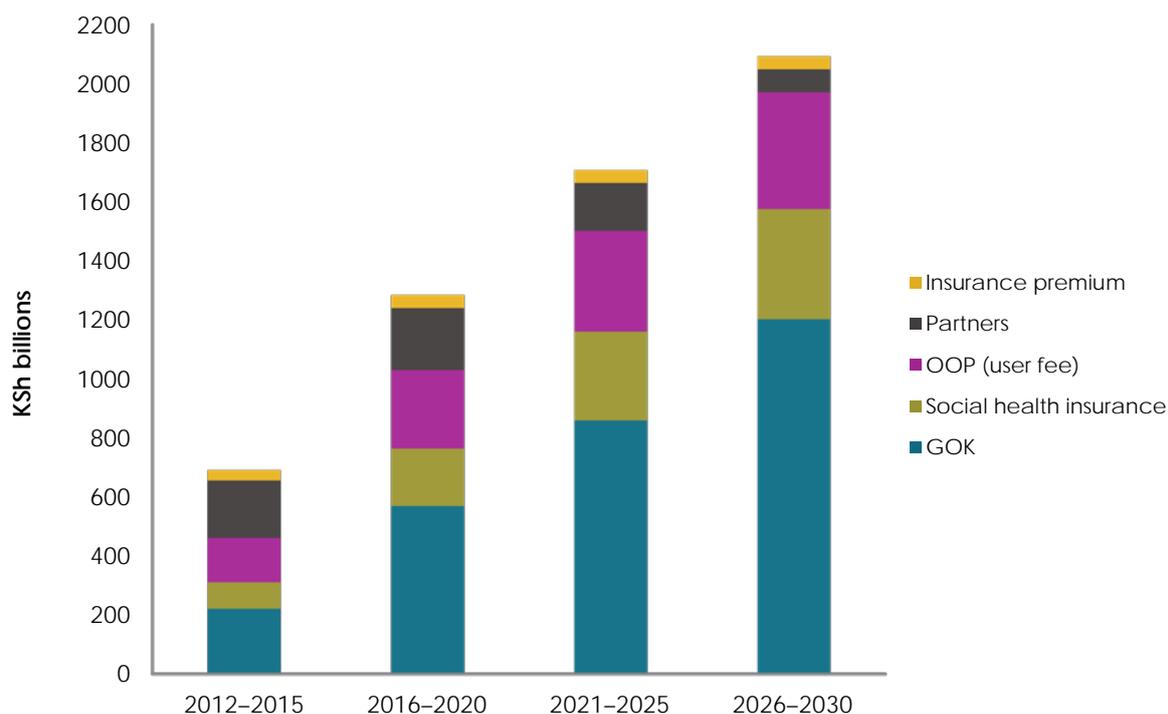


Source: Authors

### Option 2 scenario

Under the Option 2 scenario, NHIF contributions are fixed at 1.5 percent of monthly gross wages for formal and informal sector employees. Additionally, employers are assumed to make similar contributions (1.5% of monthly gross wages) on behalf of their employees. Key stakeholders have suggested that this rate be used when NHIF is restructured. For other financing sources, contributions were maintained at the same levels used in Option 1. The results of the Option 2 scenario analysis are presented in Figure 9.

**Figure 9. Health Financing by Contribution Type, Option 2 Scenario, FYs 2013/14–2029/30 (including base FY 2012)**



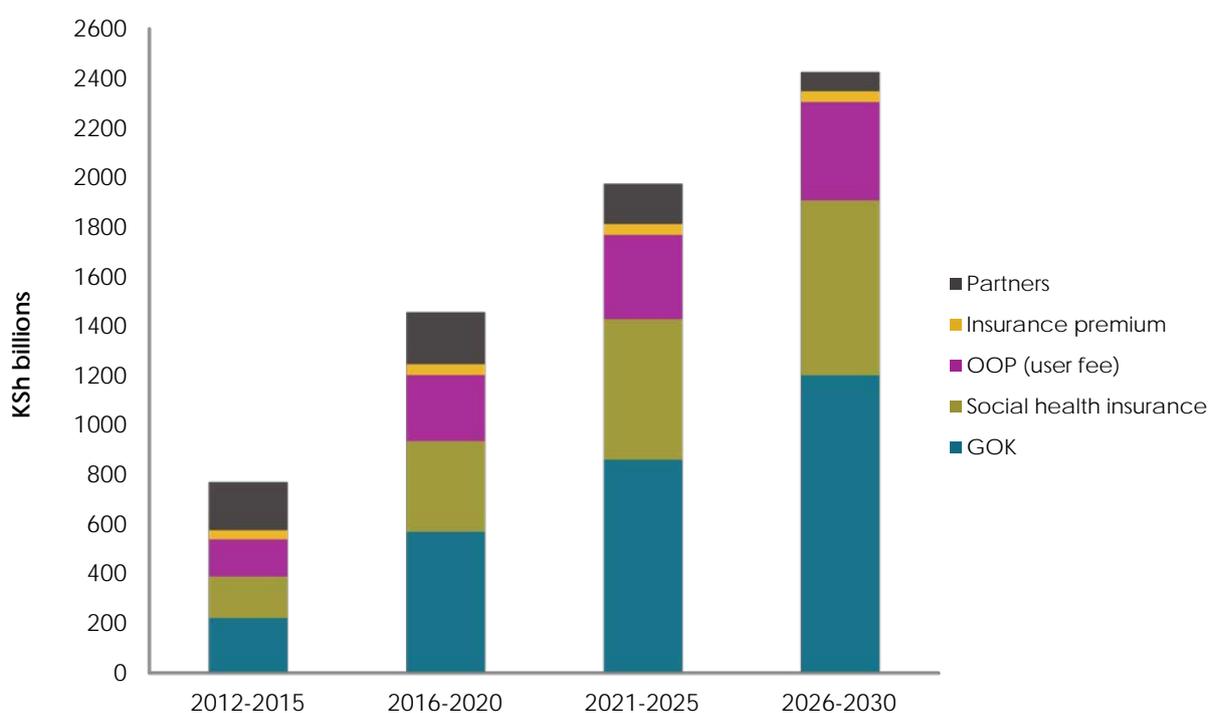
Source: Authors

Under Option 2, the estimated total financial resources from the sources shown in Figure 9 will increase from KSh 693 billion in FYs 2012–2015 to KSh 1,284 billion in FYs 2016–2020, KSh 1,707 billion in FYs 2021–2025, and KSh 2,092 billion in FYs 2026–2030. The total amount for the entire period represents an increase of 42 percent compared to the Base case scenario.

### Option 3 scenario

In Option 3, the assumptions are similar to those of Option 2 except that the fixed contribution to social health insurance is 3.0 percent rather than 1.5 percent. The expected resources under this scenario are significant; an estimated increase of 63 percent compared to the Base case scenario. The estimated amounts are KSh 771 billion in FYs 2012–2015, KSh 1,455 billion in FYs 2016–2020, KSh 1,974 billion in FYs 2021–2025, and KSh 2,424 billion in FYs 2026–2030.

**Figure 10. Health Financing by Contribution Type, Option 3 Scenario, FYs 2013/14–2029/30 (including base FY 2012)**



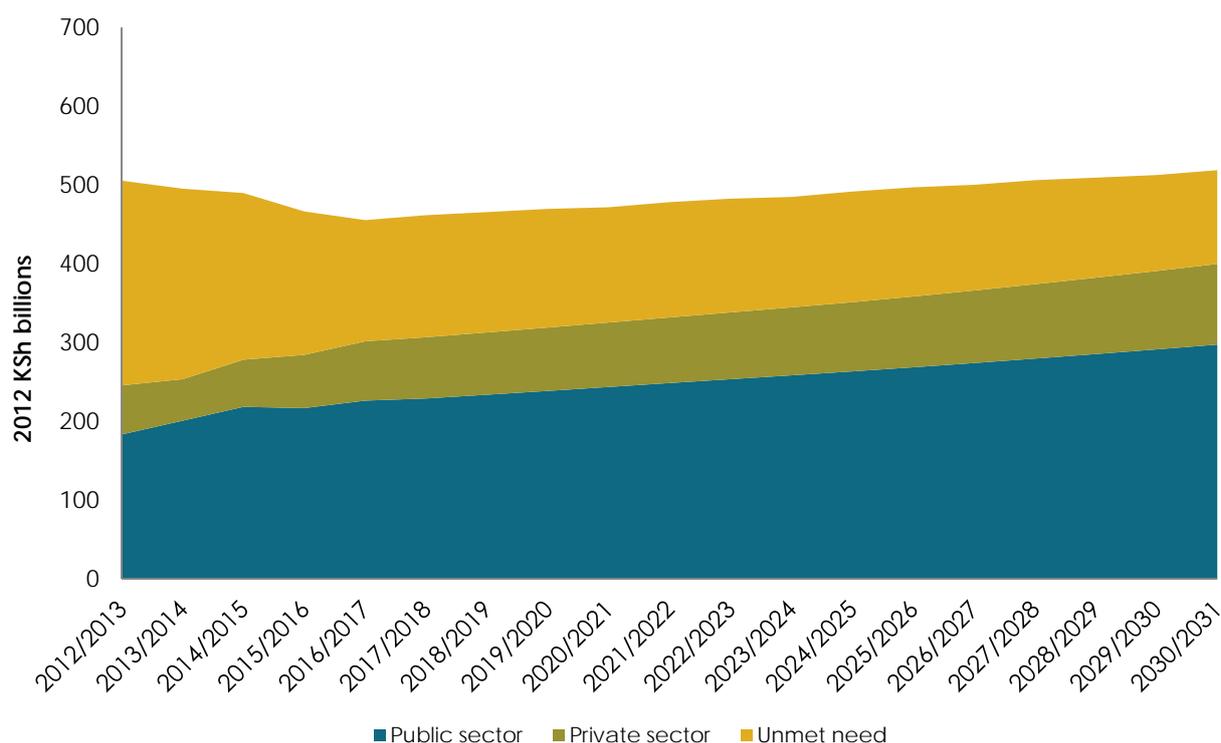
Source: Authors

## Long-term Cost Projections

### *Business-as-usual scenario*

The Business-as-usual scenario projected the cost of the health sector, including health service coverage across all sectors and unmet need, to be KSh 518 billion by FY 2030. This represents a KSh 13 billion increase from the total cost in FY 2012. Figure 11 shows a moderate decrease in the overall cost by 10 percent over FYs 2012–2016. This is largely attributed to early investments in the public health system infrastructure under the *KHSSP-III*. Over the same period, the portion of total cost supporting the unmet need will decline from 51 percent to 34 percent of the total health sector cost, as coverage in the public and FBO/NGO nonprofit sectors scale up per the *KHSSP-III* targets.

Figure 11. Health Sector Cost, Business-as-Usual Scenario, FYs 2013/14–2029/30 (including base FY 2012)

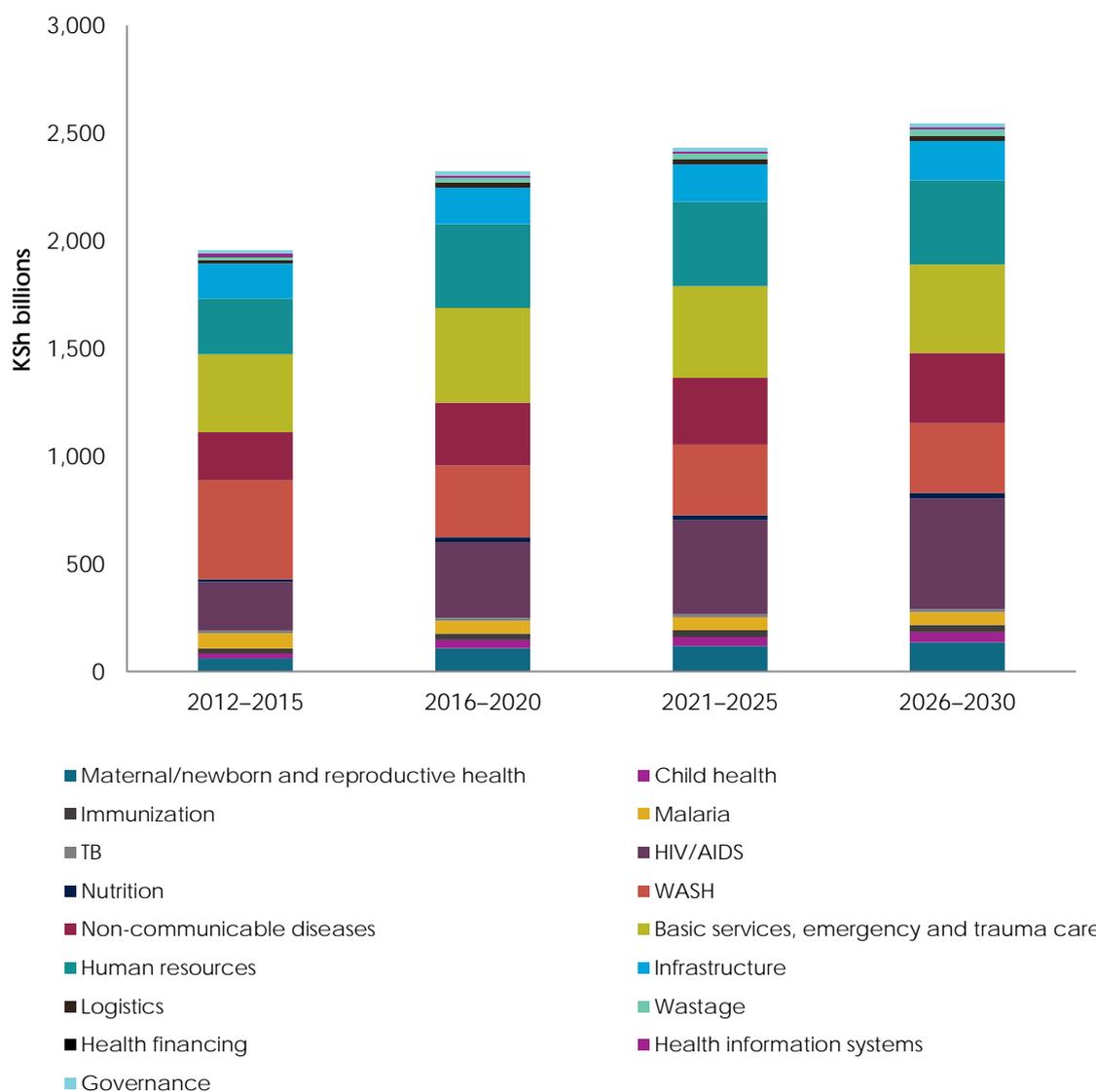


Source: Authors

After 2017, the relative (percent) coverage targets for service delivery across sectors and epidemiological indicators will remain constant at 2017 levels through 2030. During this 13-year period, the contribution of unmet need to the overall cost will continue to fall as the share of the nonprofit and for-profit sectors increase from 50 to 57 percent and 17 to 20 percent, respectively. This is likely correlated with the rising cost of HIV prevention, care, and treatment services shown in Figure 12. This pattern of cost distribution is mirrored across all three scenarios.

HIV is the only program area whose share of the total health sector cost will consistently increase from FY 2012 to FY 2030; it will constitute 12 percent of the total health sector cost over FYs 2012–2015, increasing to 17 percent over FYs 2026–2030. The reason for this surge is the growing demand for HIV services, generated by the AIDS Impact Module. The rate at which the number of HIV-positive individuals eligible for antiretroviral treatment (ART) increases will outpace the population growth rate.

**Figure 12. Health Sector Cost, Business-as-Usual Scenario, FYs 2013/14–2029/30 (including base FY 2012)**

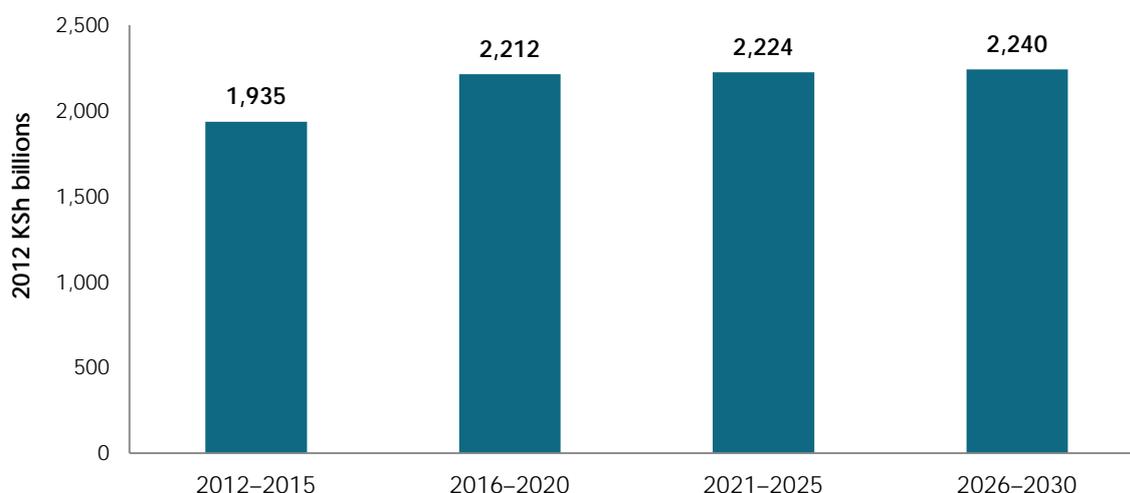


Source: Authors

### **Optimistic scenario**

Under the Optimistic scenario, the total cost to meet the needs of the health sector will peak in FY 2012 at KSh 505 billion. Similar to the Business-as-usual scenario, the total cost of the health sector will decrease approaching FY 2017 due to front-loaded investments in the public health system infrastructure under *KHSSP-III*. Under the Optimistic scenario, the health sector cost will plateau after FY 2016, increasing by only KSh 9 billion over the following 14-year period. Consequently, reductions in costs due to technological advancements and the decreasing burden of communicable diseases will almost completely outweigh the increasing cost to serve the growing population. As a result, the share of the health sector cost generated by service delivery (through programs such as malaria and maternal, neonatal, and reproductive health) will fall relative to the contribution of health systems components (e.g., human resources). Over FYs 2012–2015, disease programs will make up 75 percent of the total health sector cost, but will fall to 72 percent by FYs 2026–2030.

**Figure 13. Health Sector Cost, Optimistic Scenario, FYs 2013/14–2029/30 (including base FY 2012)**



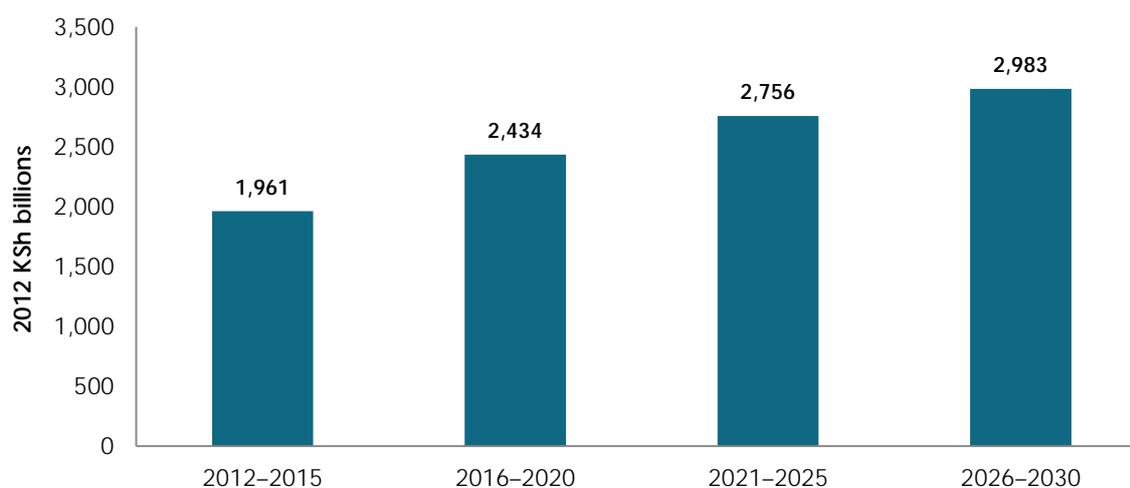
Source: Authors

***Pessimistic scenario***

The Pessimistic scenario projects a dramatic increase in the cost of the health sector following FY 2016, owed to the rising prevalence of NCDs and drug resistance. If the predicted epidemiological shift occurs, the health sector will cost KSh 612 billion by FY 2030, a 33 percent increase from FY 2016. Figure 14 shows the projected health sector cost in five-year intervals from FYs 2012–2030. As shown, the contribution of NCD services to the total health sector cost will increase from 11 percent over FYs 2012–2016 to 18 percent over FYs 2026–2030, due to accelerated growth in service demand. Private sector coverage is high for NCD services. Therefore, the contribution of the private sector to the total health sector need accelerates rapidly over FYs 2016–2030 in this scenario, while the portion of cost reflecting the unmet need declines rapidly.

The cost of TB and HIV services will also rise, although less drastically, due to the higher-cost, second-line treatments required for those with drug-resistant HIV and those with drug-resistant TB.

**Figure 14. Health Sector Cost, Pessimistic Scenario, FYs 2013/14–2029/30 (including base FY 2012)**

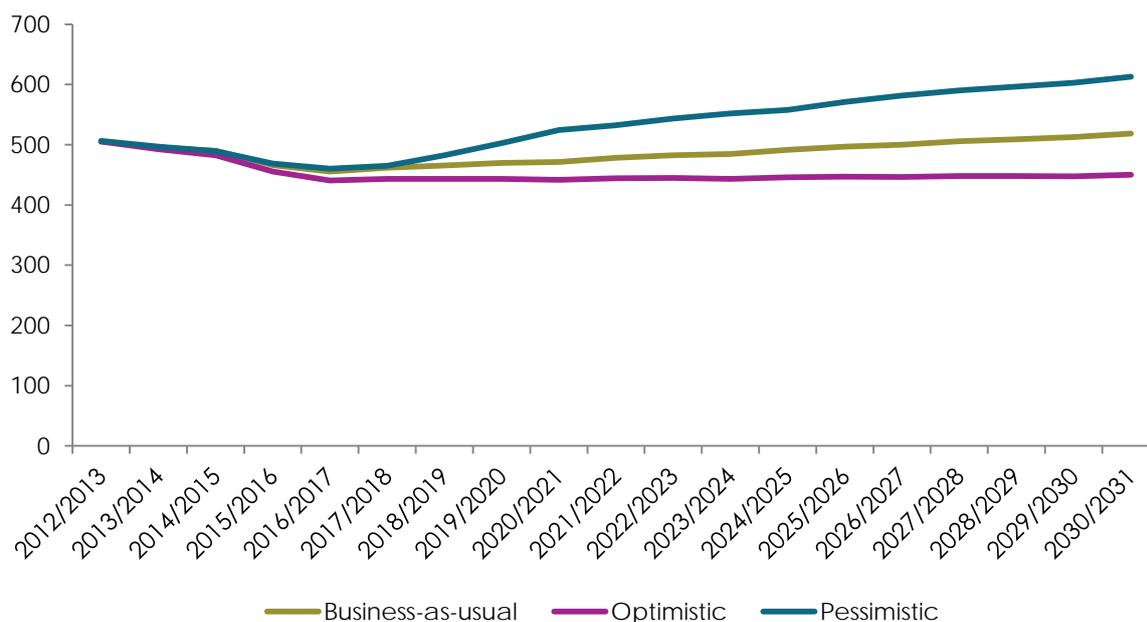


Source: Authors

### Scenario comparison

The cost to finance the total need of the health sector under each of the three scenarios (Business-as-usual, Optimistic, and Pessimistic) is presented in Figure 15. The effects of the early investments in public health system infrastructure, discussed previously, dominate the trend in cost through FY 2016. In FY 2030, however, the Optimistic scenario will cost KSh 68 billion less than the Business-as-usual scenario, while the Pessimistic scenario will cost KSh 94 billion more. Over FYs 2012–2030, a total of KSh 649 billion in cost savings are possible under the Optimistic scenario compared with the Business-as-usual scenario.

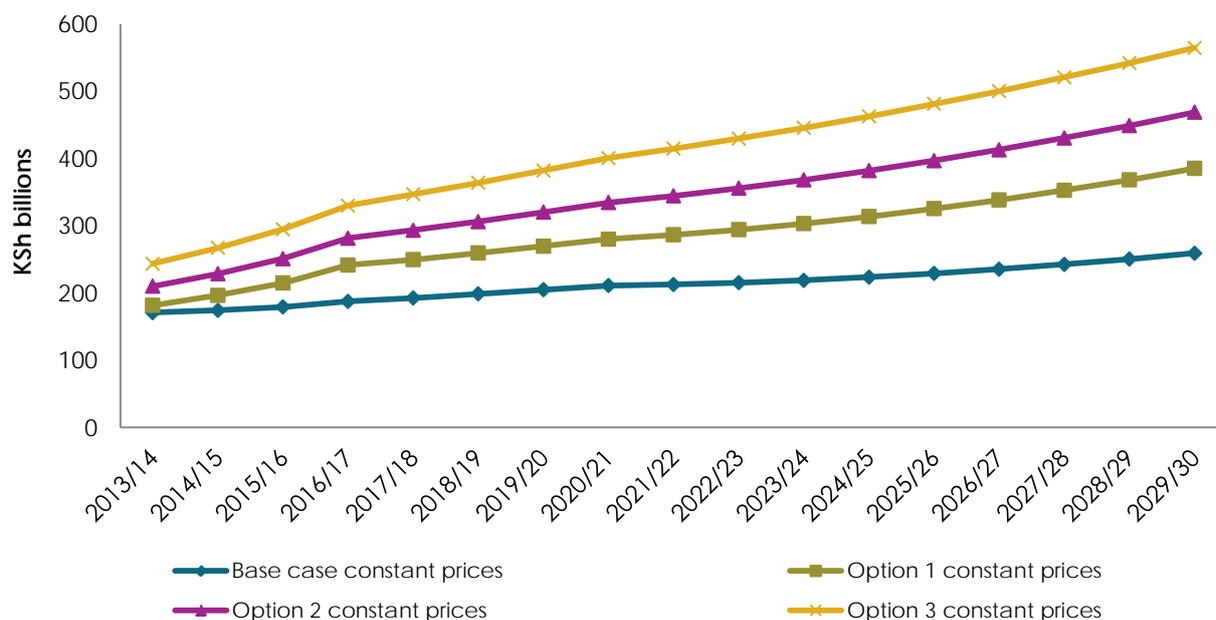
Figure 15. Comparison of Health Sector Cost Across Scenarios, FYs 2013/14–2029/30 (including base FY 2012)



Source: Authors

Figure 16 shows that with Option 3, under the Optimistic scenario for health costs, enough finances can be mobilized for the health sector. At 2012 constant prices, the estimated amount of available resources was KSh 244 billion in FY 2013/14, which will rise progressively to reach a maximum of KSh 565 billion in FY 2029/30.

Figure 16. Trends in Resources from Base Case, Option 1, Option 2, and Option 3 Scenarios, FYs 2013/14–2029/30



Source: Authors

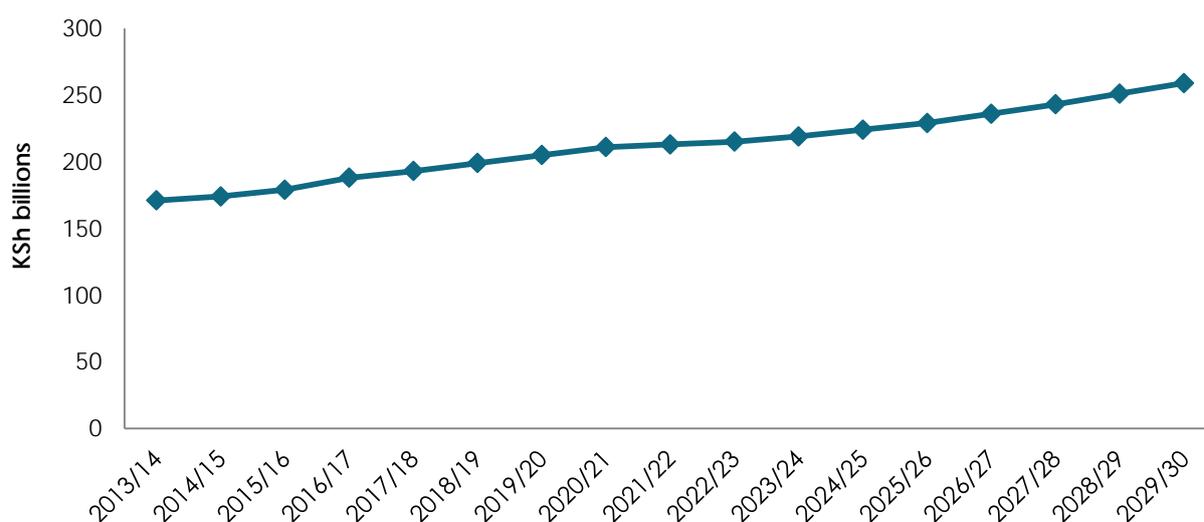
## Gap Analysis

The study team conducted a gap analysis of the difference between the estimated cost of services and estimated resources. It was based on the three scenarios and with respect to different financing options. The results of the analysis are presented below.

### Gap analysis with base case scenario resources

Figure 17 shows the trend for estimated resources from FYs 2013/14–2029/30. The amount of resources available in each year was converted using constant 2012 prices. The GDP deflator was used, and 2012 had a deflator equivalent to 100 percent. The 2012 prices were also used for the cost of health services in each scenario: Business-as-usual, Pessimistic, and Optimistic. Figure 17 shows the trends in the Base case resources, which are estimated to increase from KSh 171 billion in FY 2013/14 to KSh 259 billion in FY 2029/30.

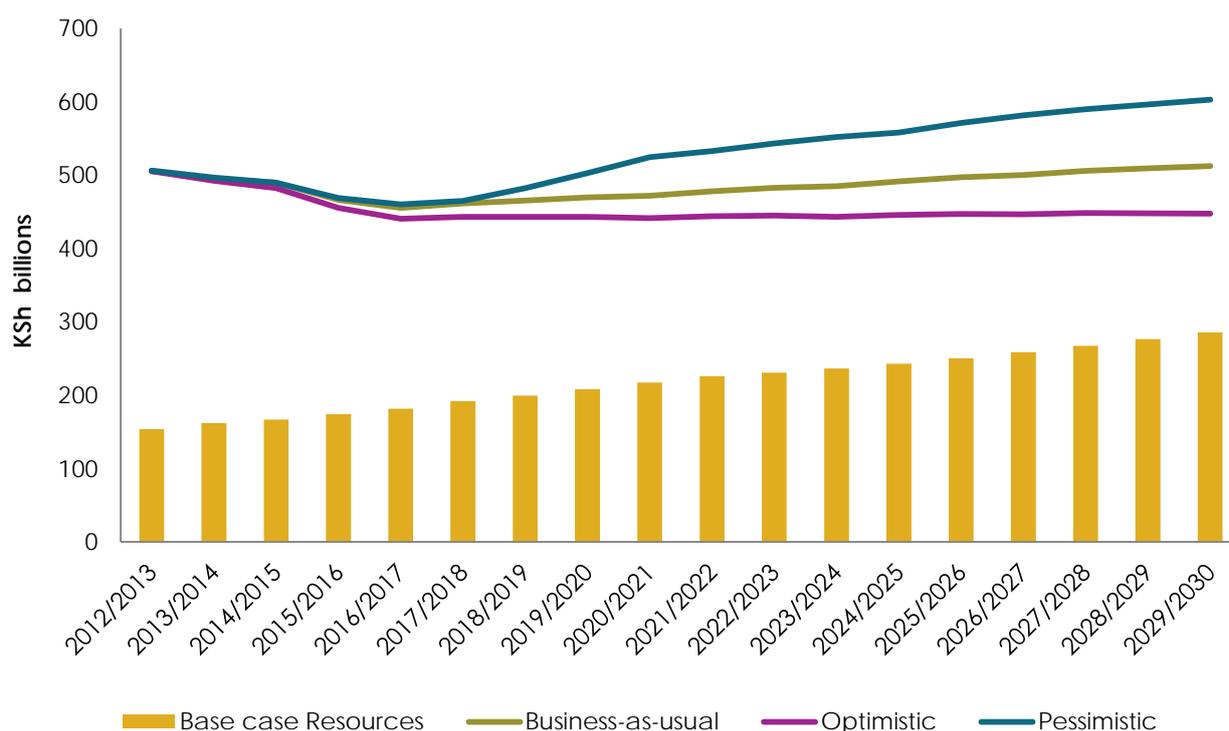
Figure 17. Trends in Estimated Base Case Resources, FYs 2013/14–2029/30



Source: Authors

Figure 18 shows that there will be a financial gap in every year of the projection.

Figure 18. Gaps in Resources Under Base Case Scenario Resources, FYs 2013/14–2029/30 (including base FY 2012)



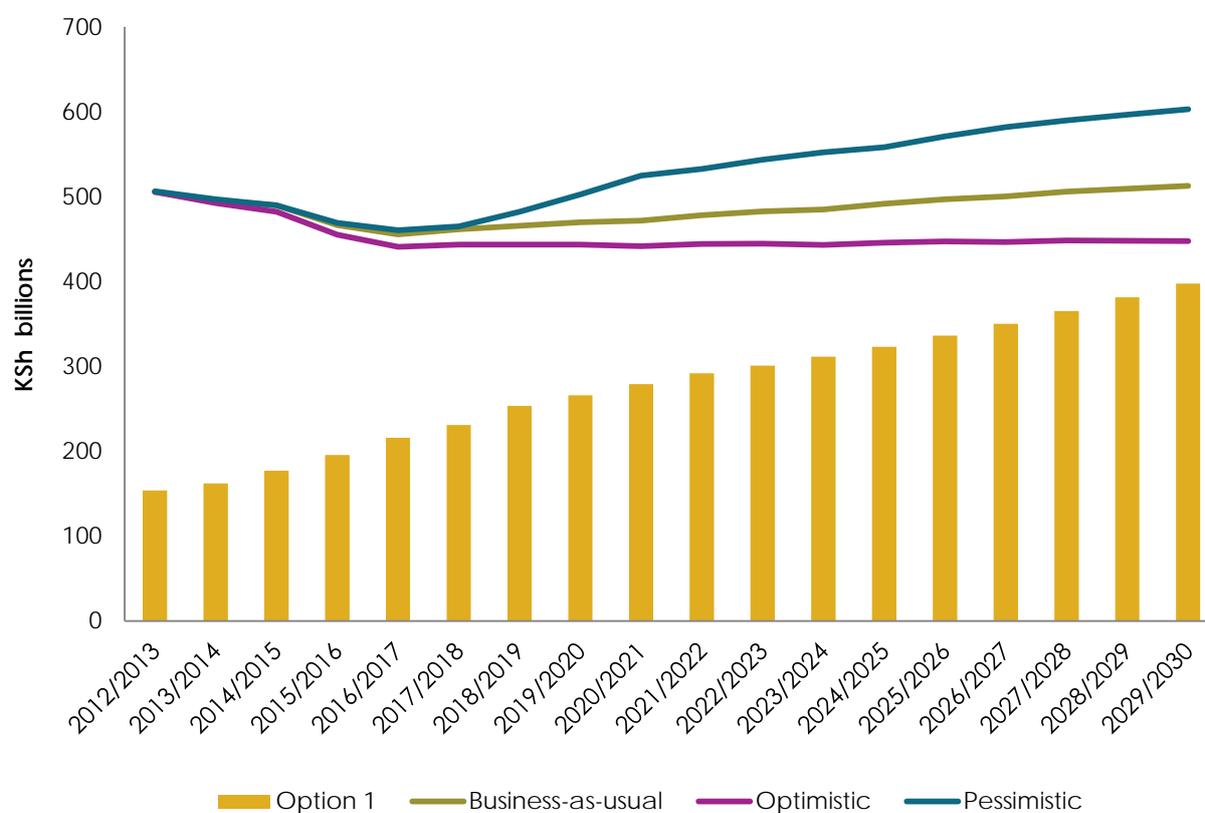
Source: Authors

### Gap analysis with Option 1

The assumptions for Option 1 were that NHIF contributions would be maintained at current levels and public health expenditure would steadily increase from 5.9 percent in FY 2011/12 to a maximum of 10 percent of total government expenditures by FY 2017/18, remaining at 10 percent through FY 2029/30. Private health insurance, OOP, and partners’ contributions would remain at the base level values for the period under consideration. Figure 19 shows the trend in estimated health financing resources given these assumptions.

Figure 19 also shows that if the government increases health expenditure to reach 10 percent of total expenditures by FY 2017/18, a significant increase in resource for healthcare financing would be realized. The total estimated amount would increase from about KSh 183 billion in FY 2013/14 to about KSh 385 billion in FY 2029/30, at 2012 constant prices. This increase translates to a reduction in financing gaps.

**Figure 19. Gaps in Resources Under Option 1 Scenario, FYs 2013/14–2029/30 (including base FY 2012)**



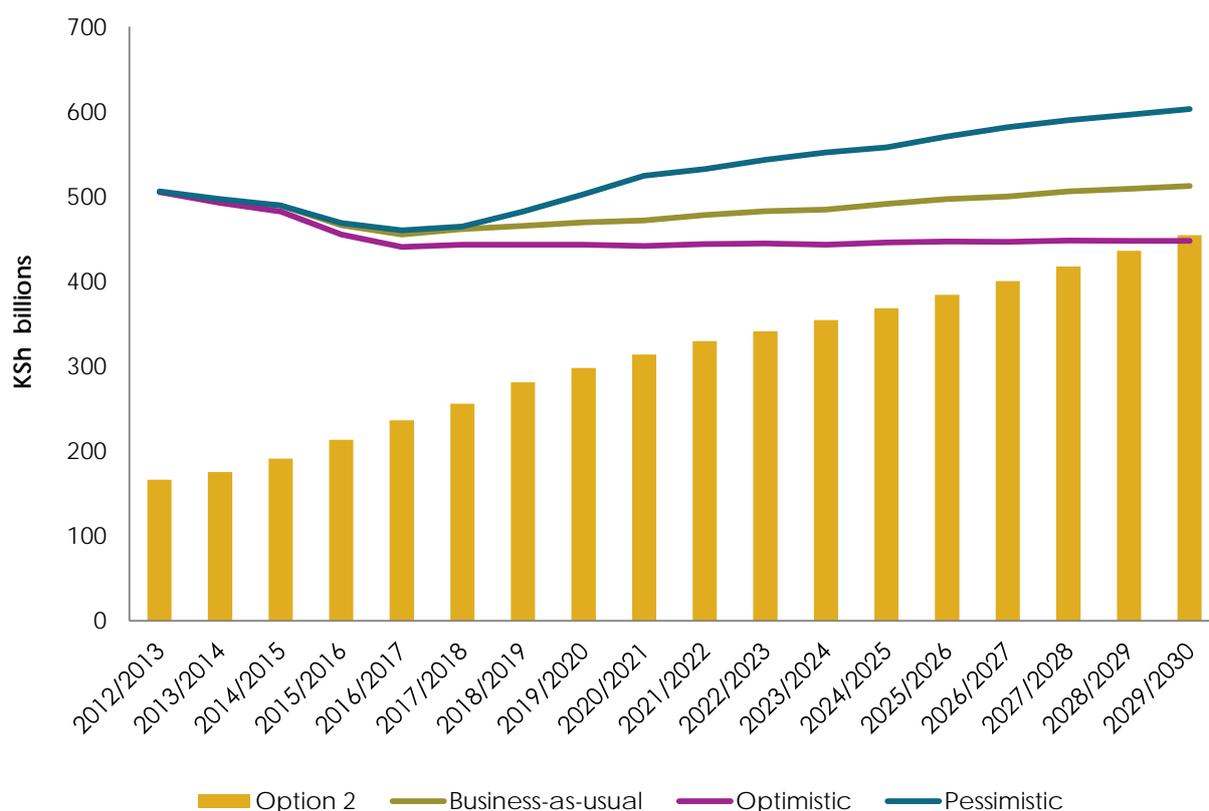
Source: Authors

### Gap analysis with Option 2

Option 2 assumes a contribution of 1.5 percent of formal sector employees’ monthly gross wages. Additionally, employers are assumed to make similar contributions of 1.5 percent of monthly gross wages for the benefit of their employees. It was suggested in policy discussions that this rate be used when restructuring the NHIF. The contribution by informal sector employees was also maintained at 1.5 percent. For the other sources, the contribution levels are the same as in Option 1.

Figure 20 shows the scope of increasing financing resources by converting the NHIF into a full social health insurance where contributions are a fixed proportion of wages. Based on projections, this change could increase the resources available for healthcare financing and narrow the financing gap.

**Figure 20. Gaps in Resources for Health Under Option 2 Scenario, FYs 2013/14–2029/30 (including base FY 2012)**

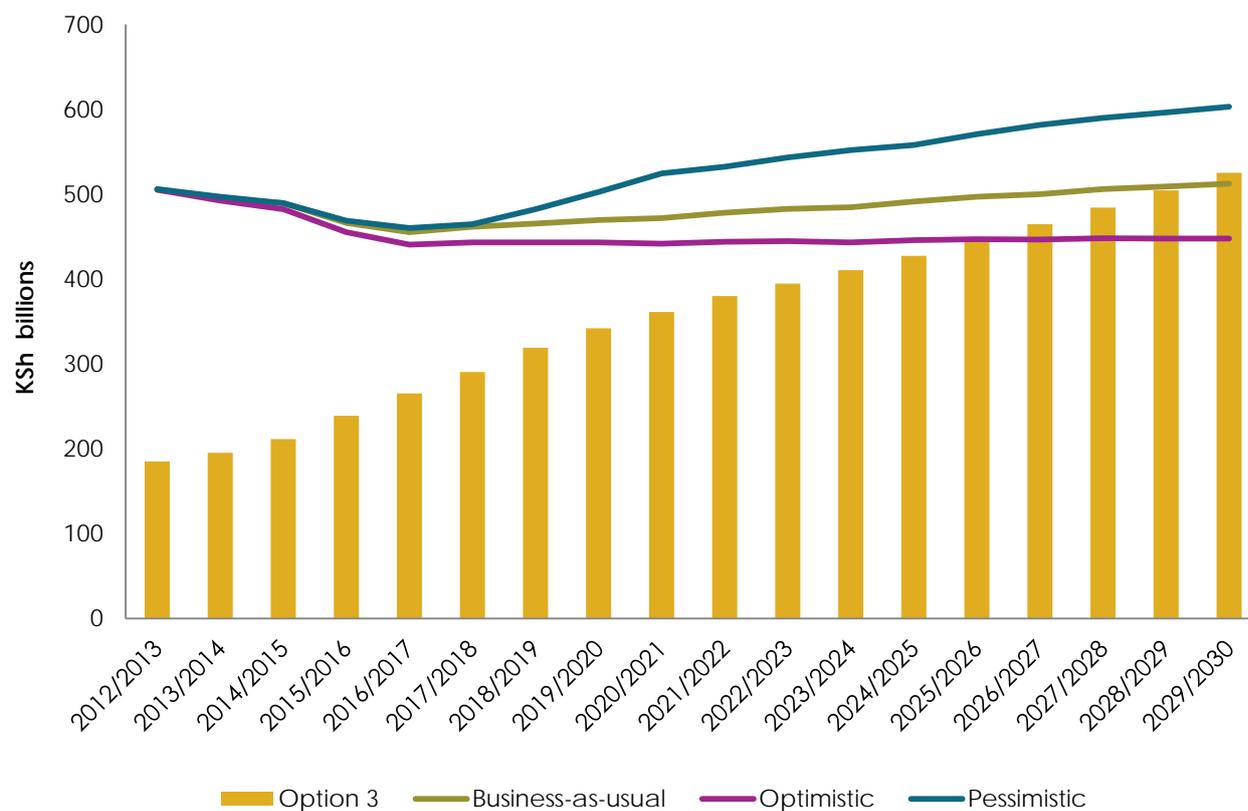


Source: Authors

### Gap analysis with Option 3

Figure 21 shows the resource gaps under Option 3, where a 3 percent fixed contribution to social health insurance was assumed. Under this scenario, the total resources mobilized will increase from KSh 185 billion in FY 2013/14 to KSh 615 billion in FY 2029/30.

Figure 21. Gaps in Resources Under Option 3 Scenario, FYs 2013/14–2029/30 (including base FY 2012)



Source: Authors

## CONCLUSION

This study estimated the long-term health delivery costs and long-term health financing options available in Kenya. The sources considered included taxes, social insurance, OOP payments, private health insurance, and partners. Four scenarios were used to estimate the possible amount of resources that could be mobilized: the Base case, Option 1, Option 2, and Option 3.

### Health Service Delivery Costs

The results of the analysis showed that, under the Business-as-usual scenario, total health service delivery costs, including unmet need, would rise to KSh 518 billion by FY 2030, a KSh 13 billion increase. Despite the overall increase, the portion of the total cost supporting unmet need under this scenario would decline from over half (51%) to about a third (34%). The Optimistic scenario would result in a more modest increase, with health service delivery costs plateauing after FY 2016. Under this scenario the health sector costs would only increase by KSh 9 billion (FYs 2016–2030), with disease programs' share of the total costs falling. Due to the assumed rise in NCDs and drug resistance, the Pessimistic scenario would lead to a dramatic increase in costs (to KSh 612 billion by FY 2030); including a significant increase in NCD services' share of total health sector costs. While labeled a “pessimistic” scenario, current literature suggests that the epidemiological trends upon which it is based (i.e., an increased burden of NCDs and drug-resistant TB and HIV) are likely to occur (Boutayeb and Boutayeb, 2005; WHO, 2010). For all scenarios, projections and estimations were made using 2012 constant prices.

The **Business-as-usual scenario** projects that the cost of the health sector, including coverage across all sectors and unmet need, will be KSh 518 billion by FY 2030. This represents a KSh 13 billion increase from the total cost in FY 2012. Over the same period, the portion of the total cost supporting unmet need will decline from 51 to 34 percent of the total health sector cost. This will occur as coverage in the public and FBO/NGO nonprofit sector scales up, per the *KHSSP-III* targets. HIV is the only program area whose share of the total cost of the health sector will consistently increase from FY 2012 to FY 2030; the HIV program will make up 12 percent of the total health sector cost over FYs 2012–2015, increasing to 17 percent over FYs 2026–2030.

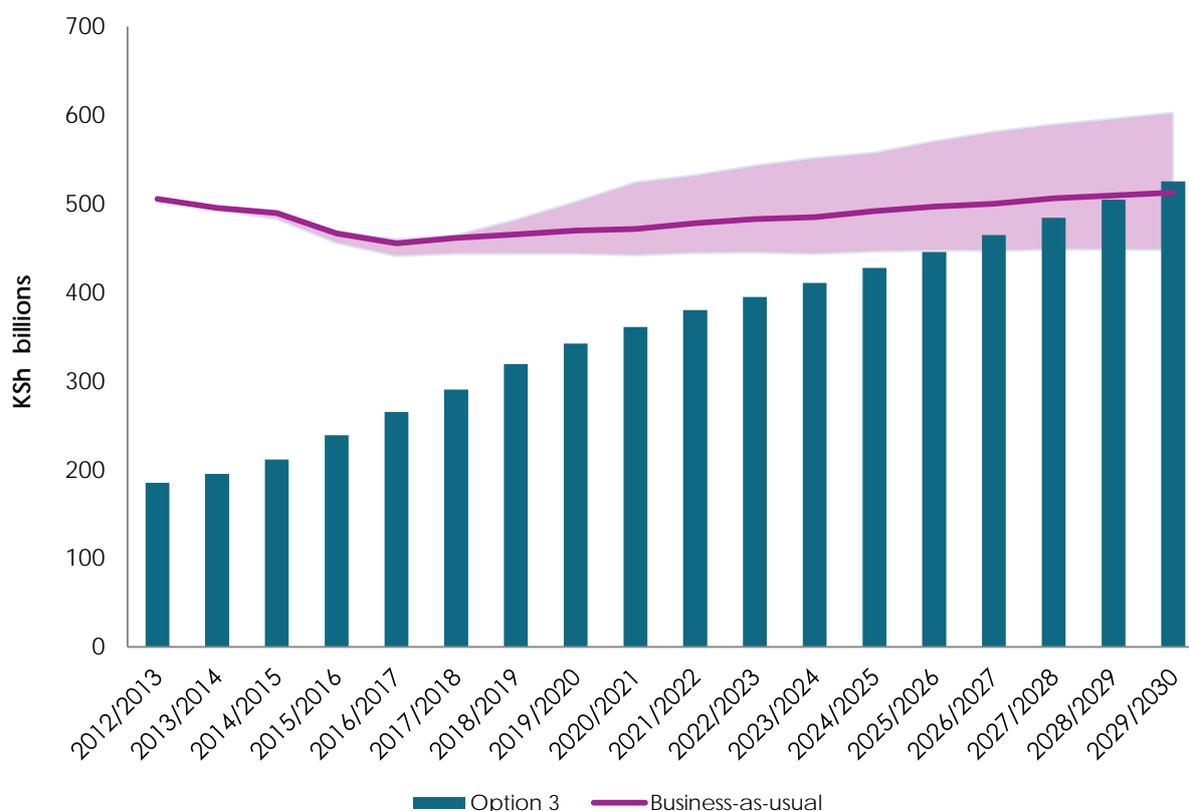
Under the **Optimistic scenario**, the total cost required to meet the needs of the health sector, will peak in FY 2012 at KSh 505 billion. Under this scenario, after FY 2016 the health sector will plateau, increasing by only KSh 9 billion over the subsequent 14-year period. Reductions in costs, due to technological advancements and the decreasing burden of communicable diseases, will almost completely outweigh the increasing cost of serving the growing population. As a result, the share of the health sector cost generated by service delivery through programs (e.g., malaria and maternal, neonatal, and reproductive health) will fall compared to the contribution of the health systems components (e.g., human resources). Over FYs 2012–2015 disease programs will make up 75 percent of the total health sector cost, falling to 72 percent by FYs 2026–2030.

The **Pessimistic scenario** projects a dramatic increase in the cost of the health sector following FY 2016, due to the rising prevalence of NCDs and drug resistance. If the predicted epidemiological shift occurs, the health sector will cost KSh 612 billion by FY 2030, a 33 percent increase from FY 2016. Due to an accelerated growth in service demand, the contribution of NCD services to the total health sector cost will increase from 11 percent over FYs 2012–2016 to 18 percent over FYs 2026–2030. Generally, private sector coverage for NCD services in Kenya is high. The cost of TB and HIV services will also increase, although less drastically, due to the higher-cost of second-line treatment required for those with drug-resistant HIV and those with drug-resistant TB.

## Health Financing Resources Available

The results of the analysis showed that the total resources generated by the Base case scenario would increase from KSh 171 billion in FY 2013/14 to KSh 259 billion in FY 2029/30. Option 1 would increase the available resources from about KSh 183 billion in FY 2013/14 to about KSh 385 billion in FY 2029/30. Options 2 and 3 indicated that social health insurance has a huge capacity for generating resources for healthcare financing if a fixed rate of gross wages is used to calculate employee and employer contributions (Figure 22). Under Option 2, estimated healthcare financing resources would rise from KSh 210 billion in FY 2013/14 to about KSh 469 billion in FY 2029/30. Under Option 3, the amount of resources would increase steadily from KSh 244 billion in FY 2013/14 to KSh 565 billion in FY 2029/30. For all scenarios, projections and estimations were made using 2012 constant prices.

Figure 22. Gaps in Resources Under Option 3 (Resources Available) Against All Resources Required Scenarios, FYs 2013/14–2029/30 (including base FY 2012/13)



Source: Authors

According to this analysis, internal resources will play a significant role as sources of funds for long-term healthcare financing in Kenya. Specifically, there is enormous potential to increase available resources for health service delivery through social health insurance. Additionally, tax revenue could substantially increase available resources, even with fiscal space (resources available) considered.

## Recommendations

Based on the results of this study, HPP recommends the following:

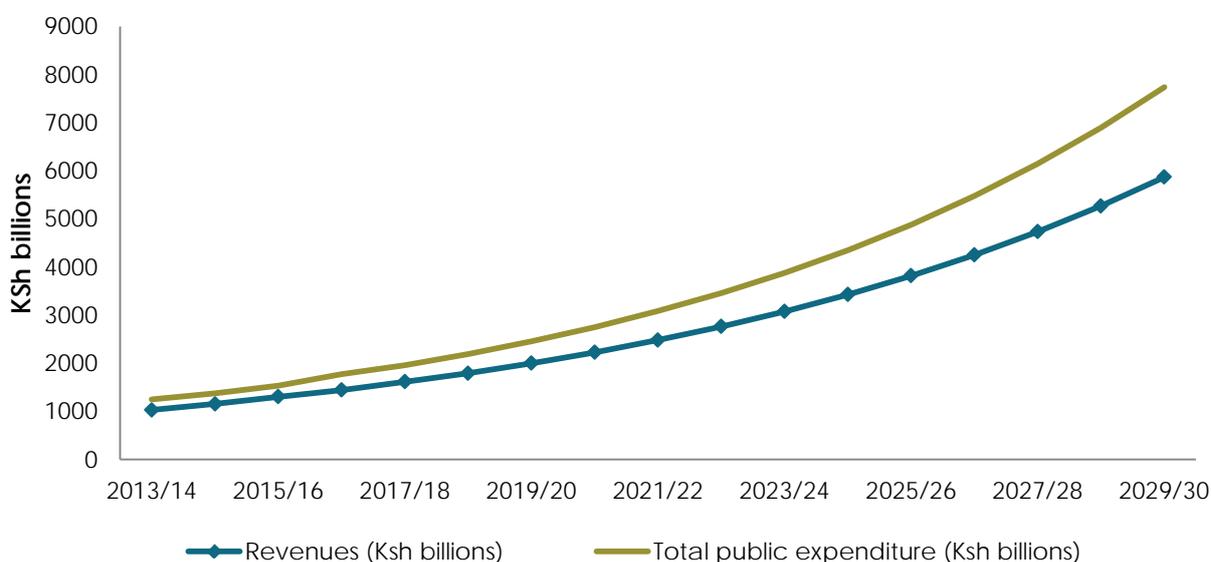
1. **Reform NHIF to provide full primary care coverage:** Raising NHIF contributions to a fixed percentage of employees' gross wages, for both employer and employee contributions, will maximize revenue from social health insurance. The NHIF could be a stable, predictable, and large financing stream for primary healthcare.
2. **Increase government expenditure as a financing source:** Raising the percentage of government expenditures on health in the overall government budget will help to bridge the financing gap. Even the modest increase considered in this study would mobilize a significant amount of resources.
3. **Improve efficiency in service delivery:** Shifting resources from more expensive tertiary hospitals to primary level facilities would reduce the costs associated with service delivery, reach more poor populations, and ensure that Kenya produces more healthcare outputs with its available resources.

# ANNEX 1. BACKGROUND PROJECTIONS AND RESULTS FOR HEALTHCARE FINANCING ANALYSIS

## Government Revenue and Expenditure Source

Financial resources, which government can mobilize from tax revenue, were estimated using the macroeconomic model developed by Oxford Policy Management to project sustainable financing for AIDS in Kenya. The model was adapted and adjusted to make it applicable for projecting resources for the health sector in general. The data used to populate the modified model were obtained from Kenya’s macroeconomic model, KenDAS, developed by the IMF and Kenya’s treasury. The KenDAS model projected government revenues and expenditure for FY 2013/14 to FY 2029/30. The projections of resources from tax revenue are presented in Figure A1.1.

Figure A1.1. Projections of Tax Revenue and Expenditure in Kenya, FYs 2013/14–2029/30



Source: Authors

Figure A1.1 shows that total domestic revenue will increase from about KSh 1,028 billion (US\$12 billion) in FY 2013/14 to KSh 5,872 billion<sup>2</sup> (US\$69 billion<sup>3</sup>) in FY 2029/30. Tax revenue constituted 95 percent of total domestic revenue. The total revenue estimate was based on an assumed tax rate of 24 percent of GDP at market prices in FY 2013/14, increasing gradually to reach 25 percent in FY 2029/30. The tax rate for each year was obtained from the KenDAS model. The GDP at market prices was computed by multiplying real GDP by the GDP deflator in each year. The source of the deflator was the KenDAS model. The real GDP was assumed to grow at about 6 percent each year, an assumption adopted from the KenDAS model.

The government expenditure was also projected to increase (see Figure A1.1) from about KSh 1,250 billion (US\$15 billion) in FY 2013/14 to KSh 7,744 billion (US\$91 billion) in FY 2029/30. The estimated expenditure had three components: recurrent expenditure, capital expenditure, and loan repayment. Recurrent expenditure and capital expenditure were calculated as percentages of GDP at market prices. In the model, the recurrent expenditure was projected to increase from about 17 percent of GDP at FY 2013/14 to 21 percent of GDP in FY 2029/30. Likewise, capital expenditure was

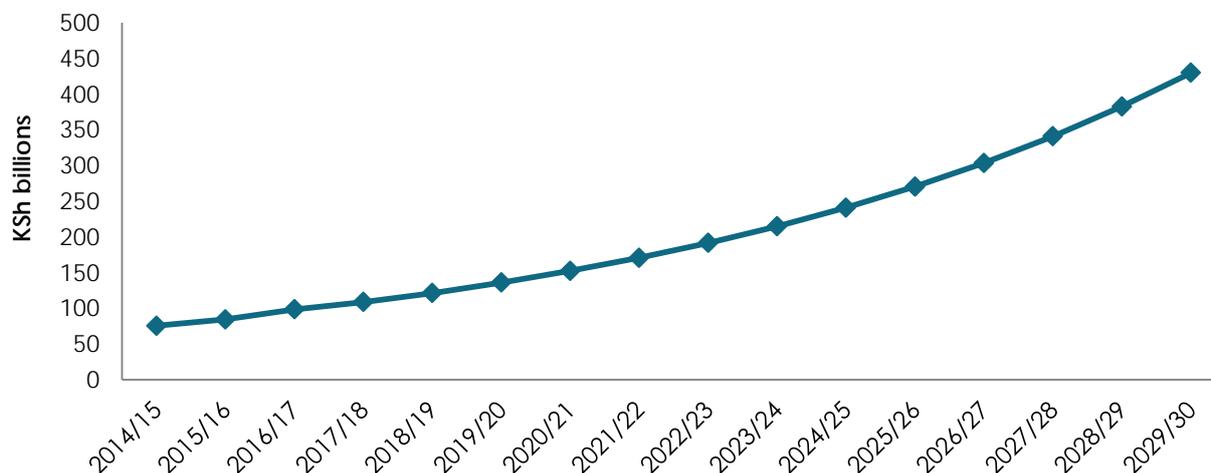
<sup>2</sup> The prices used are those of 2012.

<sup>3</sup> Exchange rate of KSh 85 per US\$1 is used throughout the document.

assumed to grow from about 10 percent of GDP each year. All the assumptions about percentages were adopted from the KenDAS model.

The estimated government expenditure was the basis for estimating the available government resources for the health sector. The projected resources from government are shown in Figure A1.2.

**Figure A1.2: Estimated Public Health Expenditure, FYs 2014/15–2029/30**



Source: Authors

As shown in Figure A1.2, estimated government resources to finance healthcare will increase steadily, from KSh 68 billion<sup>4</sup> (US\$800 million) in FY 2014/15 to KSh 430 billion (US\$5.06 billion) in FY 2029/30. The estimated healthcare financing by government was based on a conservative view of public health expenditure at about 6 percent of the government expenditure. In FY 2012/13, public health expenditure was about 6 percent of government expenditure. This percentage was maintained throughout the period of the projection, but it could change if the government decides to move toward achieving the Abuja target of allocating 15 percent of government resources to the health sector.

### **Social health insurance**

According to the draft Healthcare Financing Policy and Strategy for Kenya, social health protection will be a new system of healthcare financing (GOK, 2009), in which social health insurance and tax financing will be the pillars. However, full mandatory national social insurance has not been established. Mandatory social health insurance was mooted in 1989, with a task force established to develop a health financing strategy and necessary legislation. The task force produced a report upon which Kenya's National Social Health Insurance Fund bill was based. The bill was passed by the national Parliament in 2004, but it was not approved by the president. As result, Kenya continues to run a partial social health insurance through the NHIF.

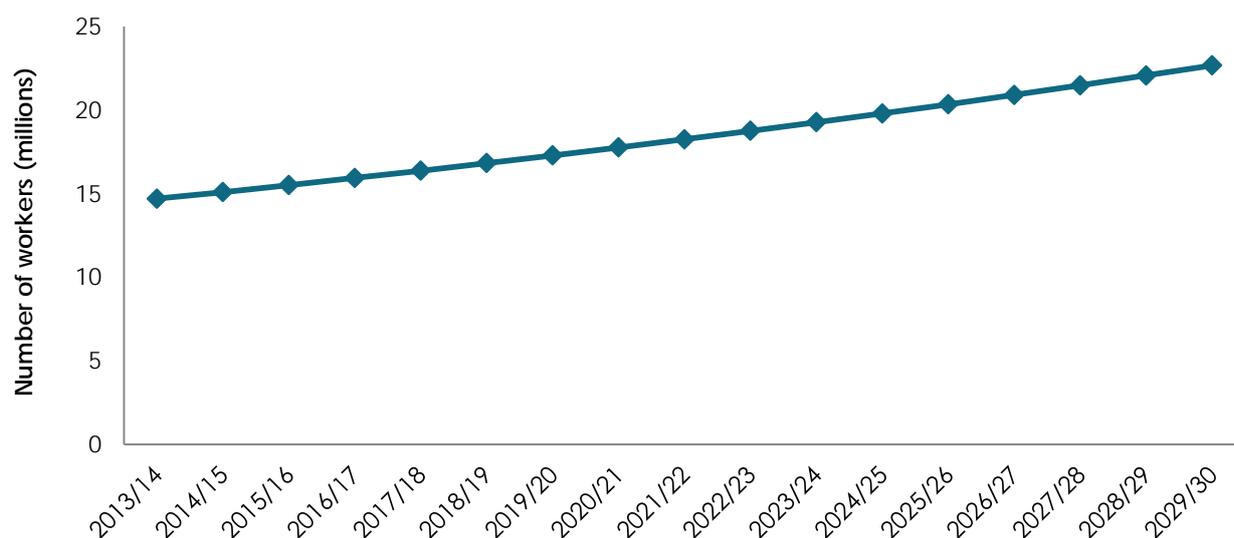
In line with the NHIF Act of 1998, the NHIF is mandated to provide social health insurance coverage to all registered members, including their dependents. All formal sector employees are required by law to enroll with the NHIF. However, in recent years, the NHIF has added a focus towards covering those in the informal sector and the indigent population. In 2012, NHIF covered 3.3 million principal members, with an estimated 8 million total beneficiaries (including dependents). This accounted for 20 percent of Kenya's population. Over the years, NHIF's membership has been following a positive growth trend (NHIF, 2012).

<sup>4</sup> Note that this was estimated on expenditure and not on government budget. Budget estimates are usually higher than actual expenditure.

The modeling for resources from NHIF was based on two primary assumptions. First was the number of contributors from the public sector, including disciplined forces, other formal sector employees, and informal sector employees. Second were the contribution rates, based on the current rates.

The number of contributors from the informal sector was estimated based on the size of the workforce, defined in the analysis as those between ages 20 and 64. This age bracket was considered instead of the 15–64 age group since most people under age 20 are still in school. The growth trend in the workforce is presented in Figure A1.3.

Figure A1.3. Estimated Total Employment in Kenya, FYs 2013/14–2029/30

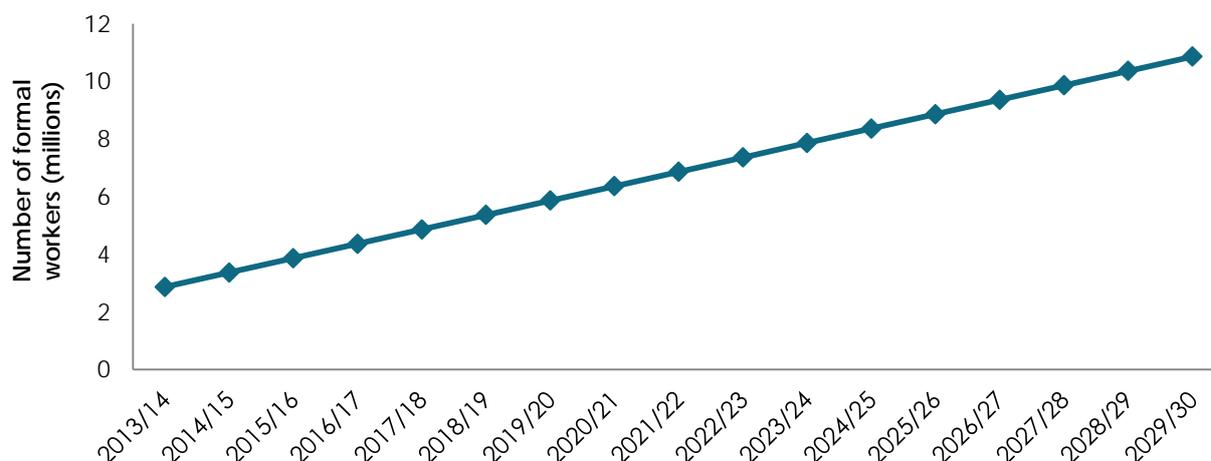


Source: Authors

The number of people in informal employment was estimated based on the assumption that 73 percent of the total workforce will be employed. A 2010 study conducted by the Institute of Economic Affairs in Kenya showed that total formal and informal employment has been about 73 percent over the last 30 years (Omolo, 2010). This assumption resulted in the estimated number of people employed increasing from about 15 million in FY 2013/14 to about 23 million in FY 2029/30, and formed the basis for estimating employment in the formal and informal sectors.

The 2010 study and the Kenya economic surveys showed that informal employment constitutes about 82 percent of total employment (Omolo, 2010). However, for projections in HPP’s analysis, a modest 0.5 million annual increase in formal employment was used. This showed a linear trend (see Figure A1.4).

Figure A1.4. Estimated Formal Sector Employment (including civil servants), FYs 2013/14–2029/30

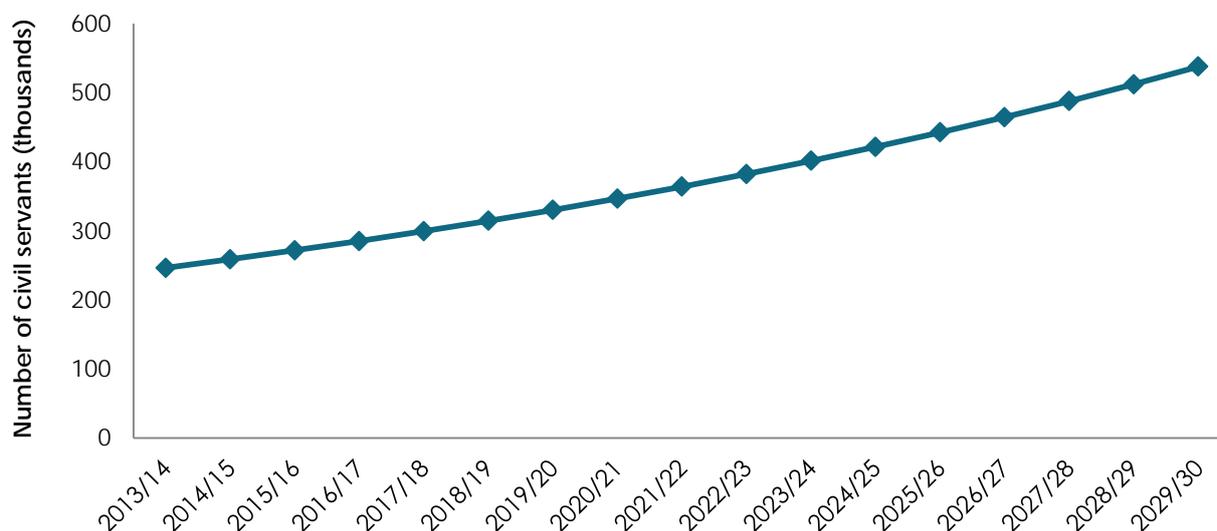


Source: Authors

Figure A1.4 shows that formal sector employment was estimated to increase from about 3 million in FY 2013/14 to about 11 million in FY 2029/30. The difference between the total projected employment and estimated formal employment gave the estimated informal sector employment, which stood at about 12 million people in each year. The fact that informal employment is projected to remain almost constant indicates that, as Kenya progresses toward middle-income status, most jobs will be created in the formal sector.

The number of public sector employees was adopted from the study carried out by OPM and was projected to increase at a rate of 5 percent annually (see Figure A1.5).

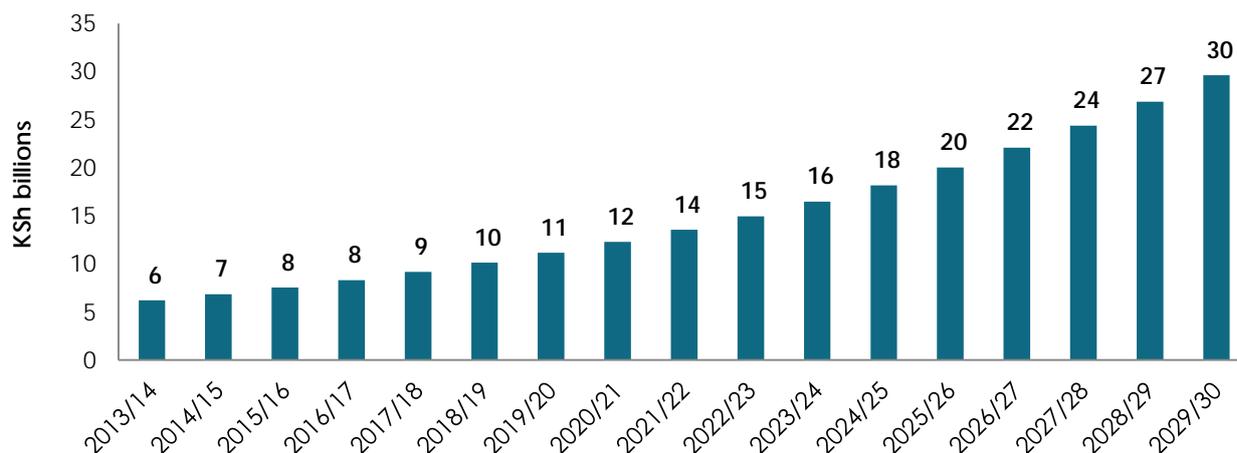
Figure A1.5. Estimated Number of Civil Servants, FYs 2013/14–2029/30



Source: Authors

Employment in the three sectors formed the basis for estimating revenue generation to finance the country's health sector. In the estimate, the formal sector was divided into two categories: the *public sector* (civil and disciplined forces) and *other formal* (private sector and parastatals). The contribution from the public formal sector was adopted from the OPM study and the results are presented in Figure A1.6.

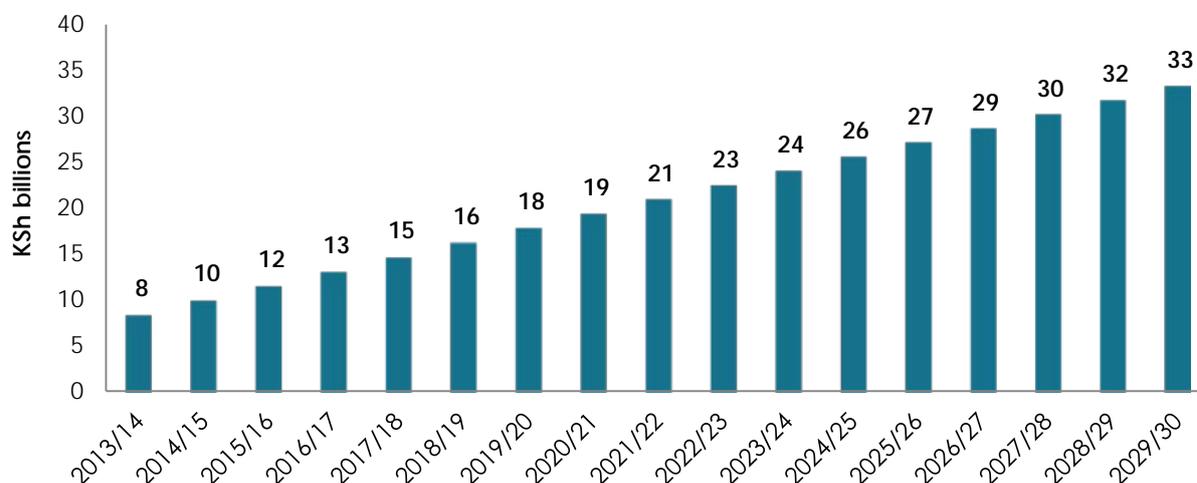
**Figure A1.6: Estimated Resources from Public Formal Sector Employee Insurance, FYs 2013/14–2029/30**



Source: Authors

Figures A1.6 and A1.7 show there is greater potential for generating healthcare financing resources from other formal sector employees’ insurance than from public servants’ insurance, including the disciplined forces. As shown above, potential revenue from public sector formal employees could increase from about KSh 6 billion in FY 2013/14 to about KSh 30 billion in FY 2029/30. The amount of revenue that could be generated from health insurance premiums from other types of formal sector employees (excluding public sector) is shown in Figure A1.7.

**Figure A1.7. Estimated Resources from Formal Sector Employees (excluding civil servants and disciplined forces), FYs 2013/14–2029/30**

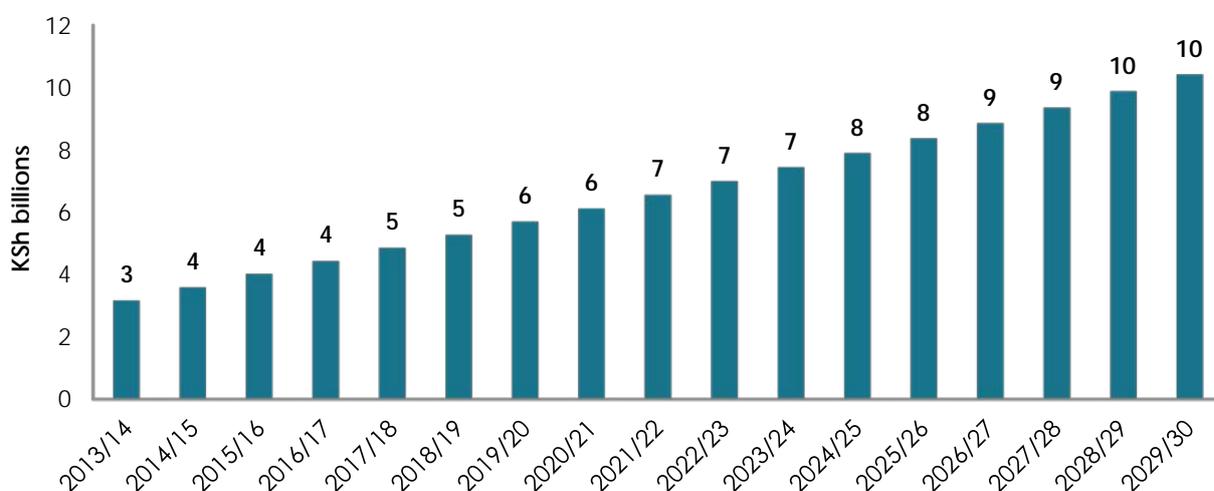


Sources: Authors

Figure A1.7 shows a significant increase in the resources from other formal sector health insurance compared to the public formal sector health insurance (Figure A1.6). This increase was attributed to the fact that old contribution rates were used in the analysis, so the highest NHIF contribution per employee was KSh 320 per month. However, the amount contributed per person was estimated to be KSh 3,228 annually. This amount was a weighted value of the median contributions by employees in different income groups. The weights were the numbers of employees in the income groups. The amount of KSh 3,228 was multiplied by the number of contributors in each year.

The estimated resources from insurance premiums from informal sector employees are shown in Figure A1.8.

**Figure A1.8. Estimated Resources from Informal Sector, FYs 2013/14–2029/30**

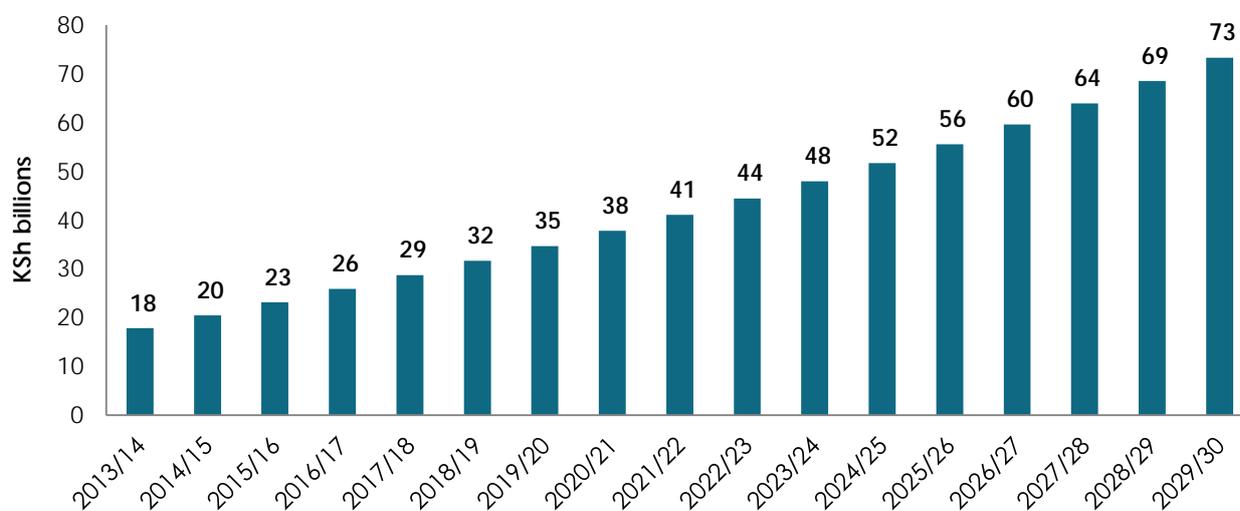


Source: Authors

The amount of revenue that could be derived from the informal sector was estimated to increase from KSh 3 billion in FY 2013/14 to KSh 10 billion in FY 2029/30. The amounts were obtained by multiplying the estimated number of contributors in the informal sector by the average annual contribution per person in the sector. The average contribution per person was estimated at KSh 160 per month. In addition, the estimated number of contributing employees in the informal sector was based on the NHIF target of at least 2 percent additional coverage of the informal sector employees annually. The base coverage for FY 2012/12 was 12 percent. For subsequent years, 2 percentage points were added to the previous year's coverage rate.

Figure A1.9 shows that the total estimated resources from the three sectors are projected to increase steadily. The amount of resources available will increase from about KSh 79 billion in FY 2013/14 to KSh 73 billion in FY 2029/30.

**Figure A1.9. Estimated Resources from Social Health Insurance, FYs 2013/14–2029/30**



Source: Authors

### Out-of-pocket expenditure

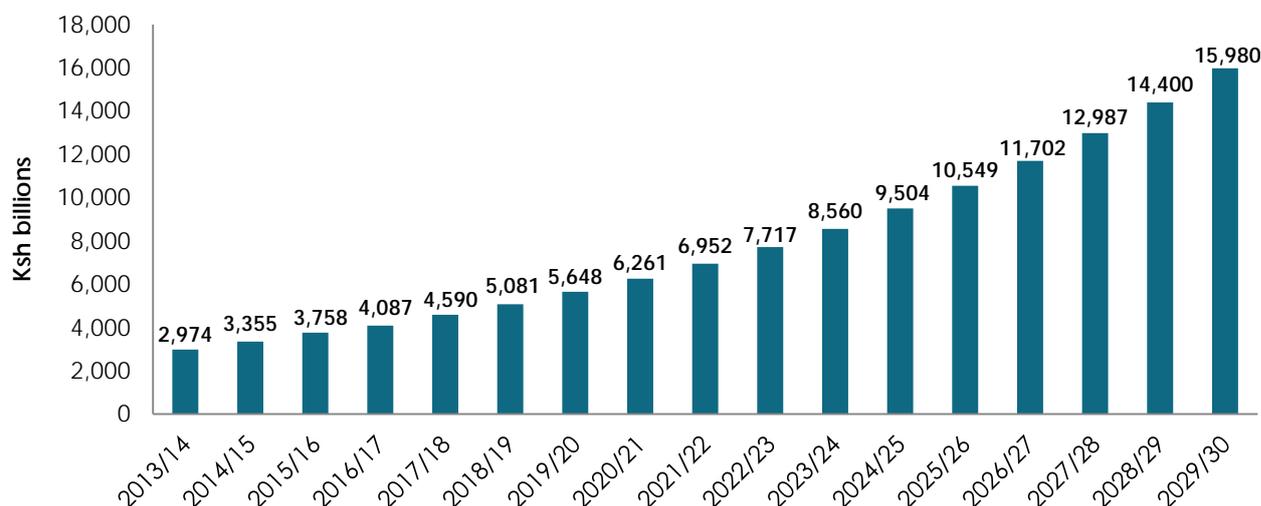
Out-of-pocket expenditure by individuals is an important source of healthcare financing in Kenya. Since the country achieved independence in 1963, private for-profit, faith-based, and NGO facilities have charged fees for their services. Similarly, the government began implementing a user fee program in public health facilities in 1989, which has been one of the main sources of healthcare financing at the facility level.

The macro model used to estimate tax revenue was also used to estimate resources from OOP expenditure. The model disaggregated the GDP in terms of consumer expenditure (C), gross investment (I), government expenditure (G), and net exports defined as exports (X), minus imports (M). This method, the expenditure approach to the measurement of GDP, is specified as:

$$GDP = C + I + G + X - M$$

The consumer expenditure (C) consists of expenditure on goods and services, including healthcare services, by households. Figure A1.10 shows the trend in consumer expenditure using the macro model. In the figure, consumer expenditure is projected to increase from KSh 2,974 billion in FY 2013/14 to KSh 15,980 billion in FY 2029/30.

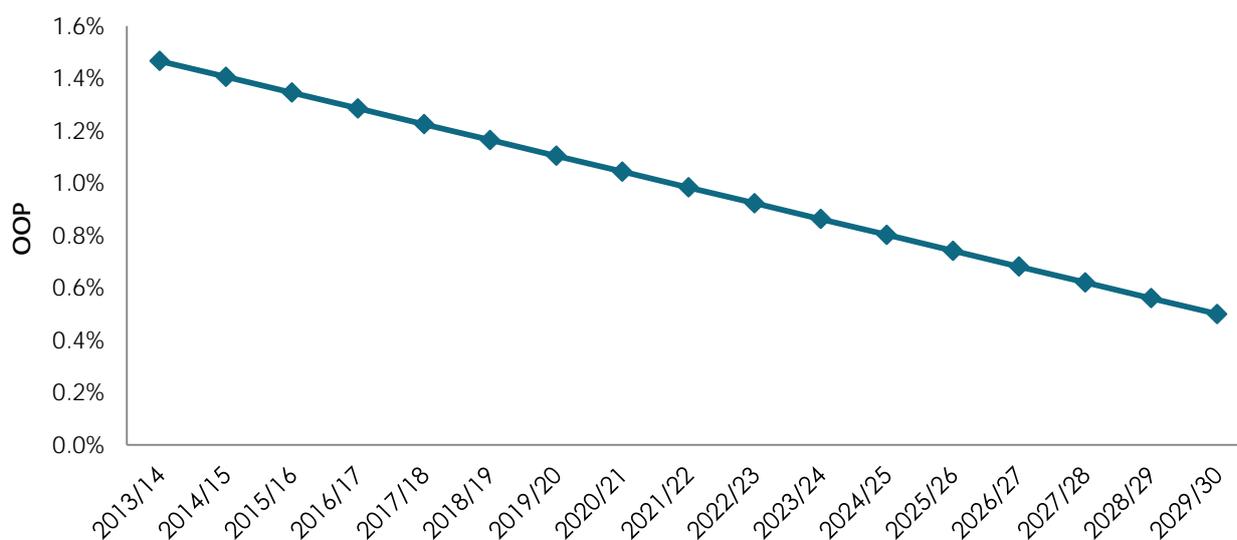
Figure A1.10. Estimated OOP Expenditure for Healthcare, FYs 2013/14–2029/30



Source: Authors

In the National Health Accounts, the estimated OOP expenditure for FY 2009/10 was KSh 30 billion, which translated to 1.6 percent of the consumer expenditure that year. In the analysis, it was assumed that this percentage would decline as households continue to enroll in social insurance (NHIF). Figure A1.11 presents the trend in the percentage of consumer expenditure used for OOP. It should be noted that this is one of many possible trends that could be used. However, the analysis was not intended to be exact but to provide an idea of possible resources that could be mobilized through OOP.

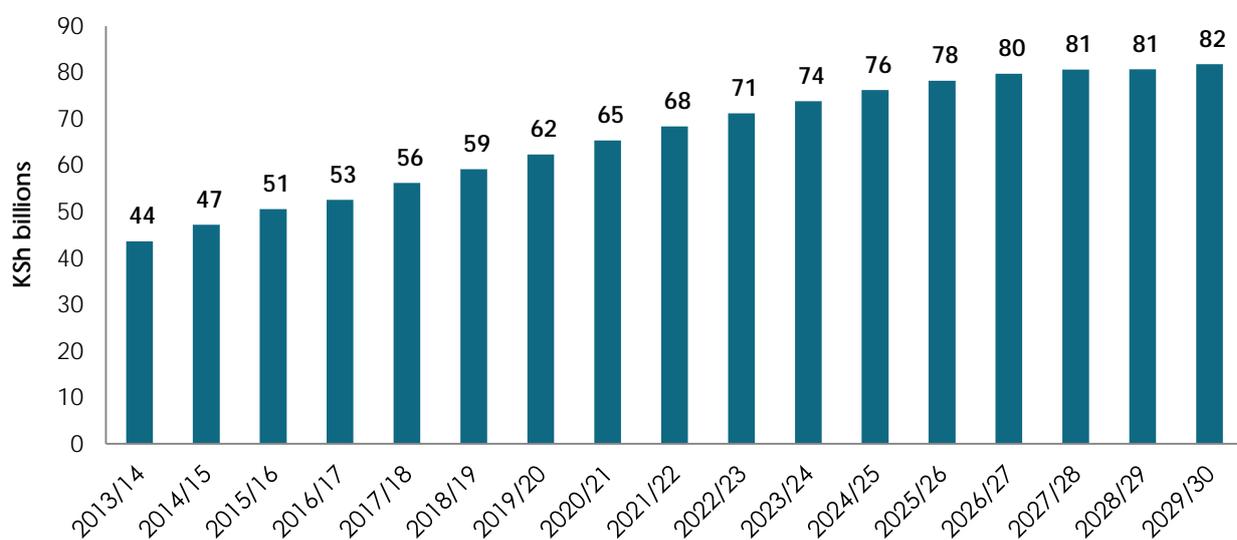
Figure A1.11. Estimated OOP as a Percentage of Consumer Expenditure, FYs 2013/14–2029/30



Source: Authors

The data on consumer expenditure in Figure A1.10 and the percentages in Figure A1.11 were used to estimate OOP. The amount of OOP for each year was computed by multiplying the consumer expenditure during the year by the corresponding OOP percentage (see Figure A1.12).

Figure A1.12. Estimated Out-of-pocket Expenditure, FYs 2013/14–2029/30



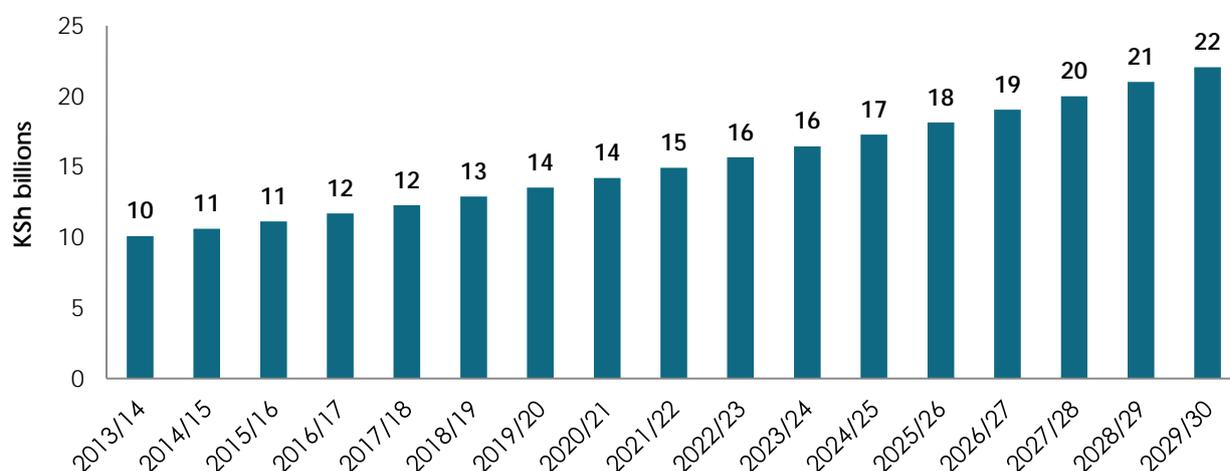
Source: Authors

Figure A1.12 shows that even with OOP decreasing as a percentage of consumer expenditure, OOP in absolute terms will increase. Overall, OOP was estimated to increase from about KSh 44 billion in FY 2013/14 to about KSh 82 billion in FY 2029/30.

### Private health insurance

The study also considered private health insurance contributions. Figure A1.13 depicts the trend in the estimated resources that could be mobilized through private health insurance.

**Figure A1.13. Trend of Estimated Resources from Private Health Insurance, FYs 2013/14–2029/30**



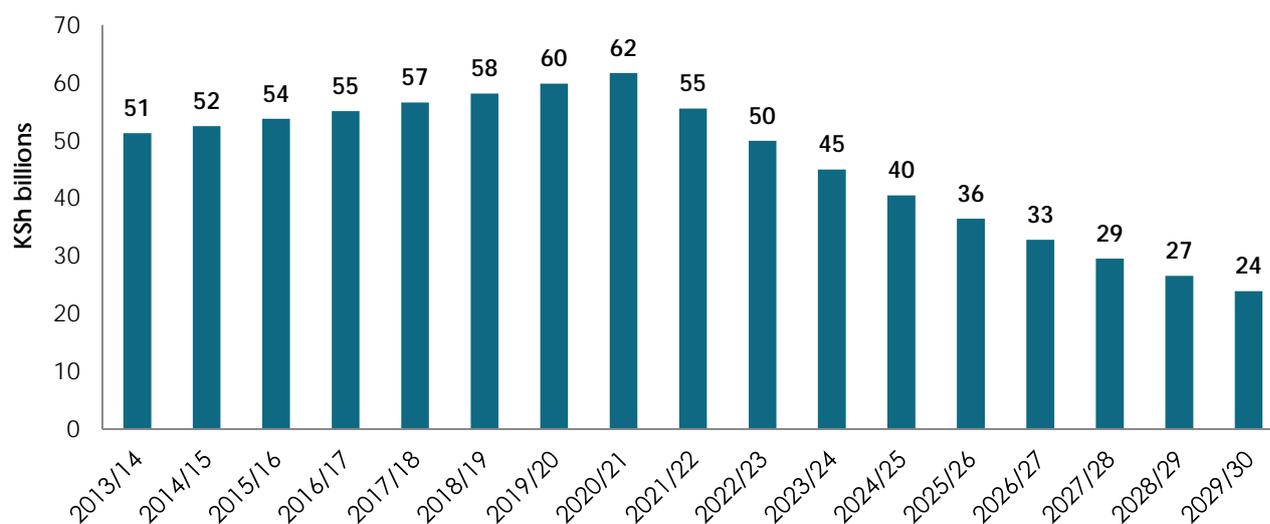
Source: Authors

Figure A1.13 shows that the amount from this source is projected to steadily increase from about KSh 10 billion in FY 2013/14 to about KSh 22 billion in FY 2029/30. The projections were based on the amount of private health insurance expenditure (KSh 8.25 billion) from the *NHA 2009/10*, which was adjusted for inflation using the consumer price index in each year of the study. The growth of private insurance has been very slow in the last three decades, so slow expansion was anticipated. The study team also anticipated that more people would enroll in social health insurance.

### Development partner support

Development partners are actively engaged in Kenya’s health sector, contributing about KSh 50 billion annually to health expenditure through government budget and off-budget channels. According to *NHA 2009/10*, expenditure from development partners amounted to KSh 42.38 billion. The projection of resources from development partners is shown in Figure A1.14.

**Figure A.1.14: Estimated Financial Resources from Development Partners, FYs 2013/14–2029/30**



Source: Authors

Development partner contributions will increase steadily between FY 2013/14 and FY 2020/21, after which they will decline. Although the total amount of development partner support in foreign currency was held constant from FY 2013/14 to FY2020/21, the amount in KSh increases due to an increase in the exchange rate over the sample period. The post-FY 2020/21 decline was based on the assumption that Kenya will attain middle-income status by FY 2020/21, at which point development partners may start to reduce their support. The analysis assumed a 10 percent annual decrease in development partner contributions.

## ANNEX 2. ADDITIONAL INFORMATION ABOUT ONEHEALTH

### Unit Costs of Service Delivery and Program Management Costs

The revised Kenya Essential Package for Health was the basis for defining service delivery within the *KHSSP-III*, incorporating almost 350 interventions across promotive, preventive, curative, palliative, and rehabilitative care. Each intervention was mapped to the corresponding department within the ministry responsible for its implementation. Program management costs incurred by the responsible department including training, supervision, monitoring and evaluation, transportation, advocacy, communications, and media and outreach were incorporated into the cost of service delivery at the program level.

For all disease programs, customized data collection sheets were designed around the OneHealth inputs to synthesize all primary and secondary data. Data on program management costs and drugs and commodities in the public sector came from several sources. Primary sources included recent costed disease strategies and their associated costing files and recent budget proposals for the Global Fund. For HIV and AIDS, the 2012 forecasting and quantification exercise was also a major source for targets and unit costs.

Where formal costed strategic plans were lacking, ministry staff used the OneHealth Excel-based tools to develop intervention unit costs from treatment standards and KEMSA or donor commodity procurement prices. The health sector analysis assumed that the costs of drugs and commodities required for services in the public and nonprofit NGO/FBO sectors were equal to those of the for-profit sector. The data collection tools were populated with programmatic coverage targets and program management costs. They also incorporated the epidemiological data from key respondents from the disease programs, supplementing as necessary with the literature review.

### Coverage Across the Public, Nonprofit NGO/FBO and For-profit Sectors

Of the 7,795 health facilities in Kenya, the public sector oversees 51 percent of health centers, the for-profit sector operates 34 percent, NGOs run 4 percent, and FBOs manage 11 percent (GOK, 2009). Most hospitals and dispensaries are operated by the public sector, “while the for-profit sector operates nursing homes and maternity facilities catering to higher income clientele” (Bliss, n.d.).

#### *Public and nonprofit NGO/FBO sectors*

Public sector costs included the nonprofit NGO/FBO sector, in addition to the government-funded health sector. Service delivery coverage in the public and nonprofit NGO/FBO sectors was determined through a consultation process with key respondents in the ministries, as described in the previous section. The scale-up of coverage of services in the public and nonprofit NGO/FBO sectors was in accordance with the *KHSSP-III* until FY 2017, and then was kept broadly constant until FY 2030.

#### *For-profit sector*

Kenya’s for-profit sector is an important component of its health system. Recent data show that 47 percent of the poorest quintile of Kenyans use private facilities when a child is sick (Barnes et al., 2010). There is a large disparity in the quality of health services in the private sector because of a “highly unregulated private health sector,” unqualified health professionals practicing in the private sector, inefficient monitoring and licensing of the private health sector, and a lack of accreditation for facilities and laboratories (Barnes et al., 2010).

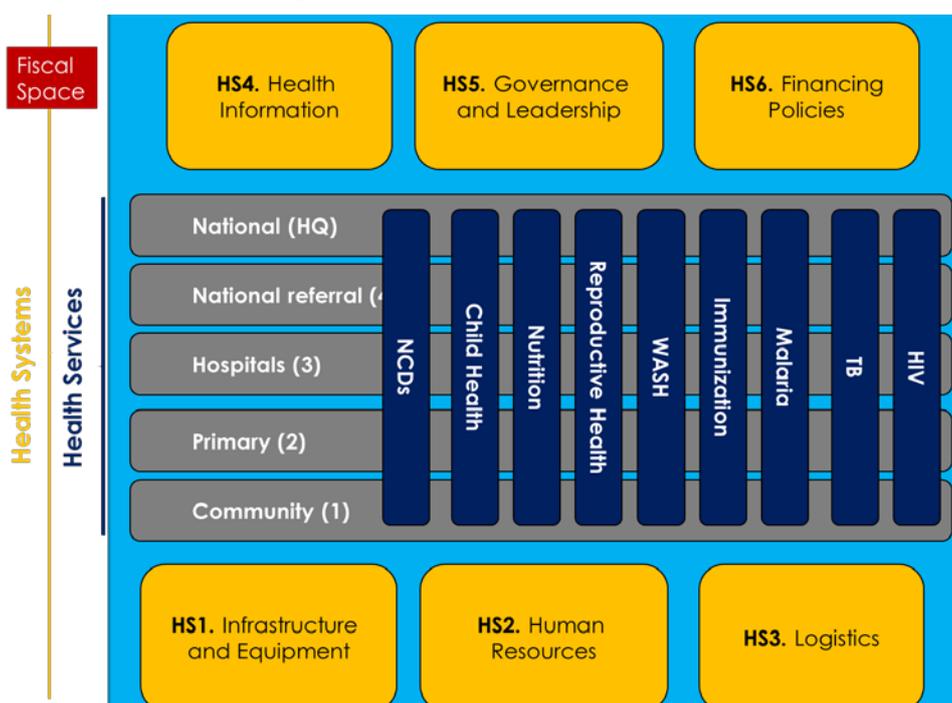
Lack of data and information about the private sector poses “a serious constraint on the ability of private sector entities to analyze risks of entering the health market.” The study team conducted a literature review about the current for-profit sector in Kenya and other developing countries in order to provide an estimate of the coverage of interventions at for-profit health facilities for the costing

model (Barnes et al., 2010; KNBS and ICF Macro, 2010; GOK, 2009). Coverage assumptions were developed by intervention and derived from estimates provided by the World Bank, the Kenya National Bureau of Statistics and ICF Macro in 2010; and the Ministry of Medical Services, the Ministry of Public Health and Sanitation, Kenya, and the *Health Sector Strategic & Investment Plan, July 2014–June 2018*. Within the nutrition program, for example, the for-profit sector had higher coverage of post-birth supplementation due to an increase in the use of private birthing facilities. Conversely, there is limited for-profit sector involvement in nutritional education due to limited resources and wealth disparities (GOK, 2009). Similar to the public and nonprofit sectors, the coverage targets within the for-profit sector increased for certain interventions between FY 2013 and FY 2017 and were kept stable thereafter.

### Health system components

OneHealth follows the WHO’s “six building blocks” formulation of the health system: health workforce, health financing, medicine and health products, health information, governance, and service delivery (Figure A2.1). Service delivery was fully costed in the analysis of the disease programs. The remaining building blocks were captured in the following OneHealth health system components: human resources, governance, infrastructure, logistics, information systems, and financing. Customized data collection sheets were designed around the OneHealth inputs for each health system component and distributed to key respondents from the Ministry.

Figure A2.1. OneHealth Structure



Source: Inter Agency Working Group on Costing, 2013

### Infrastructure and equipment

The cost of infrastructure in the public sector reflects the construction of new facilities and the rehabilitation and operation of existing facilities. Procurement and maintenance of general equipment, furniture, and vehicles at the facility level is also reflected here. Unit costs and targets were determined through consultation with the respective ministry departments.

The study team had little basis for determining post-FY 2017 infrastructure costs because the *KHSSP-III* only defines health sector construction plans through 2015. Consequently, the team assumed no construction costs would be incurred from FY 2016 to FY 2030. Recurrent investments, such as rehabilitation, maintenance, and national-level administration costs, were held constant from FY 2017

through FY 2030. The study also assumed that replacement-level vehicle procurement would continue, based on a five-year working life.

The cost of the for-profit health system, including human resources and facility overhead, was calculated using Excel-based analyses. Through consultation with key respondents in the ministries, the study team determined the cost of for-profit facility overhead (including infrastructure, equipment, and supply chain costs) to be approximately 17.5 percent of the total cost of drugs and commodities procured.

### ***Human resources***

Human resources costs were based on the ministries' current staffing (early 2013) and latest salary and benefit schedule adjustments (July 2012). Cadre-specific scale-up targets were derived from the *KHSSP-III*.

To estimate the cost of human resources after FY 2017, the study team adopted conservative assumptions. Specifically, that the number of health personnel would increase proportionate to projected population growth, about 3 percent, without annual salary or benefit increases.

The total for-profit sector workforce was extrapolated from the total number of registered medical personnel, as reported by the 2011 Kenya Economic Survey, less the staff strength of the ministries (KNBS, 2011). Due to a lack of data, the study team used public sector salaries and benefits as proxy salaries and benefits for for-profit sector staff. After FY 2017, the team maintained annual staff targets, salaries, and benefits at FY 2017 levels.

### ***Logistics***

Public sector logistics are the purview of KEMSA. In costing the *KHSSP-III*, logistics costs encompassed KEMSA storage, transportation, and national-level administration. The cost of drugs and commodities which are procured but never consumed (i.e., "wastage") is also reflected here. Since the national wastage rates are largely unknown in Kenya, the study team conservatively assumed a uniform 5 percent wastage rate across all drugs and medical supplies. However, anecdotal evidence suggests this may be as high as 50 percent for certain immunization-related commodities. Wastage is calculated as a percentage of the total cost of services across all disease program areas.

To estimate post-FY 2017 logistics costs, the study team assumed constant warehouse operating costs, workers' wages, third-party logistics contracts, and national-level administration costs. Under the *KHSSP-III*, warehouse rehabilitation was only planned for FY 2012, so no warehouse rehabilitation or construction was accounted for after FY 2017.

The methodology used for infrastructure was also used to estimate distribution costs in the for-profit sector.

### ***Governance and leadership***

Governance and leadership costs were based on funding for various national departments and coordination units, such as the department of Planning and Feasibility Studies under the Ministry of Medical Services (MOMS) and Ministry of Public Health & Sanitation (MOPHS) FY 2012/13 budgets (Development and Recurrent Votes). The headquarter budgets of other departments that play cross-cutting roles in service delivery, like the National Public Health Laboratory Services, were also included. Scale-up to FY 2017 was based on a continuation of the FY 2012/13 to FY 2014/15 funding growth rate by activity. However, future governance costs are subject to uncertainty, with Kenya's two ministries (MOMS and MOPHS) merging over FY 2013/14 and the ongoing devolution of roles and responsibilities to the county level. Given this context, the study team kept the total governance cost in FY 2017 constant through FY 2030.

***Financing policies and health information systems***

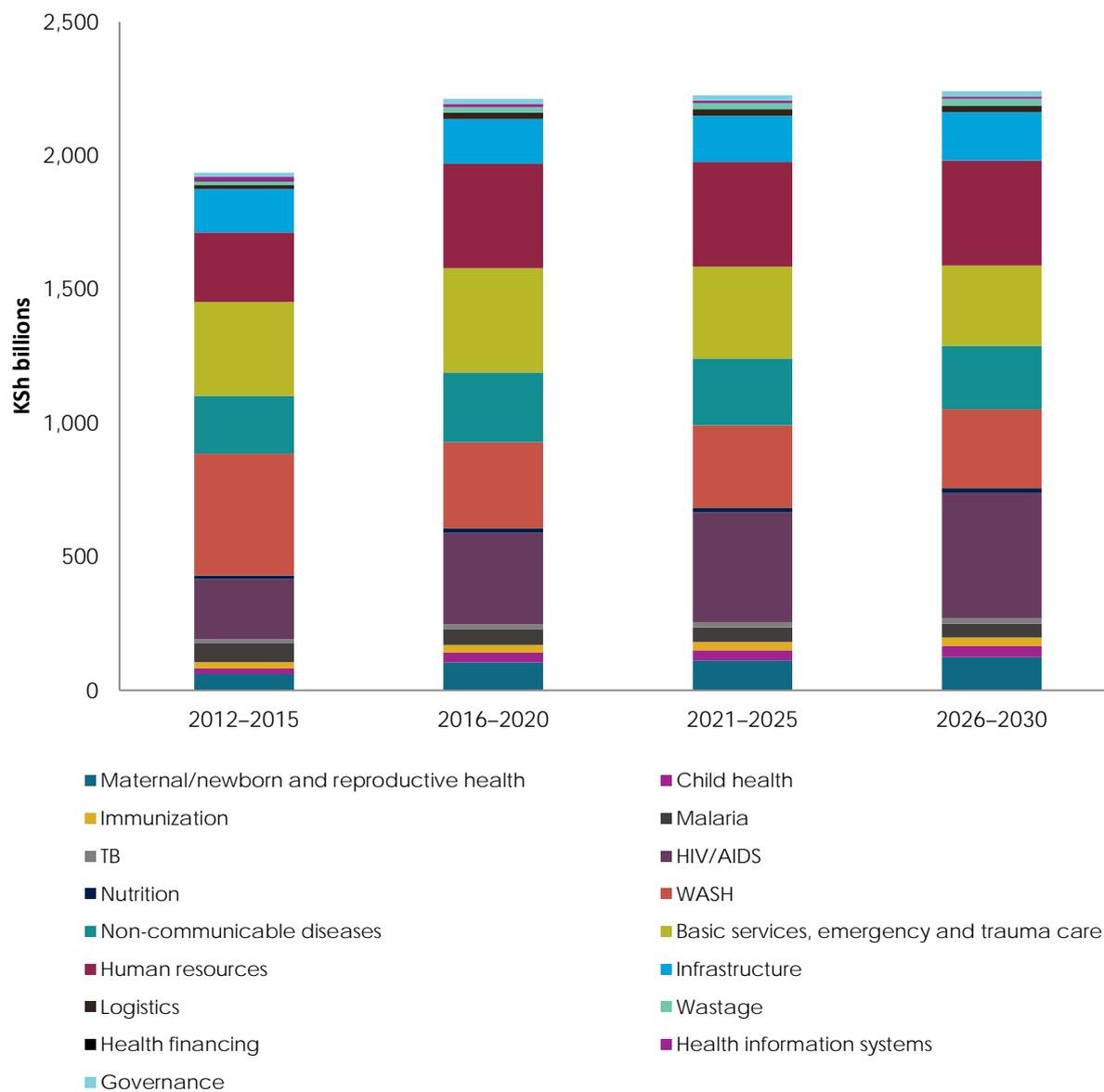
Health financing initiatives, such as performance-based financing for healthcare workers funded through the World Bank, were included in the costing of the *KHSSP-III* and in national public sector administration costs.

Similarly, the study team estimated the cost of the health management information system and its national-level administrative costs to determine the public sector information system cost. Currently, the private sector does not input data into a health information system. However, Kenya's health management information system is expanding and is considered to be comprehensive of the health sector.

# ANNEX 3. ADDITIONAL DETAILS FOR COSTING SCENARIOS

## Optimistic Scenario

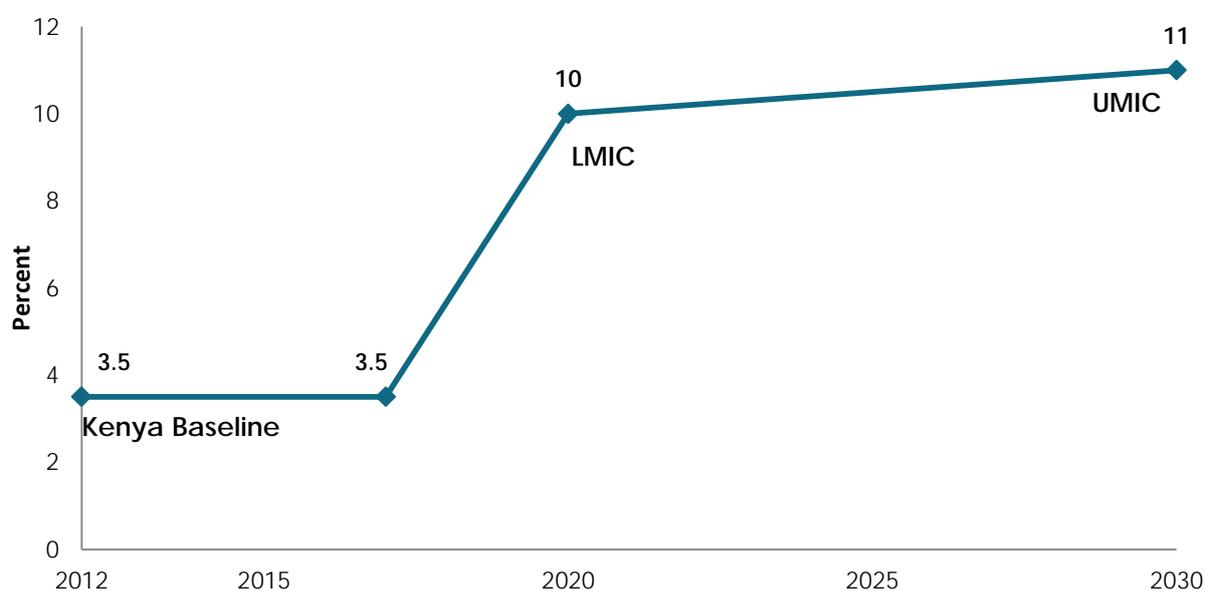
Figure A3.1. Health Sector Cost, Optimistic Scenario, FYs 2013/14–2029/30 (including base FY 2012)



Source: Authors

## Pessimistic Scenario

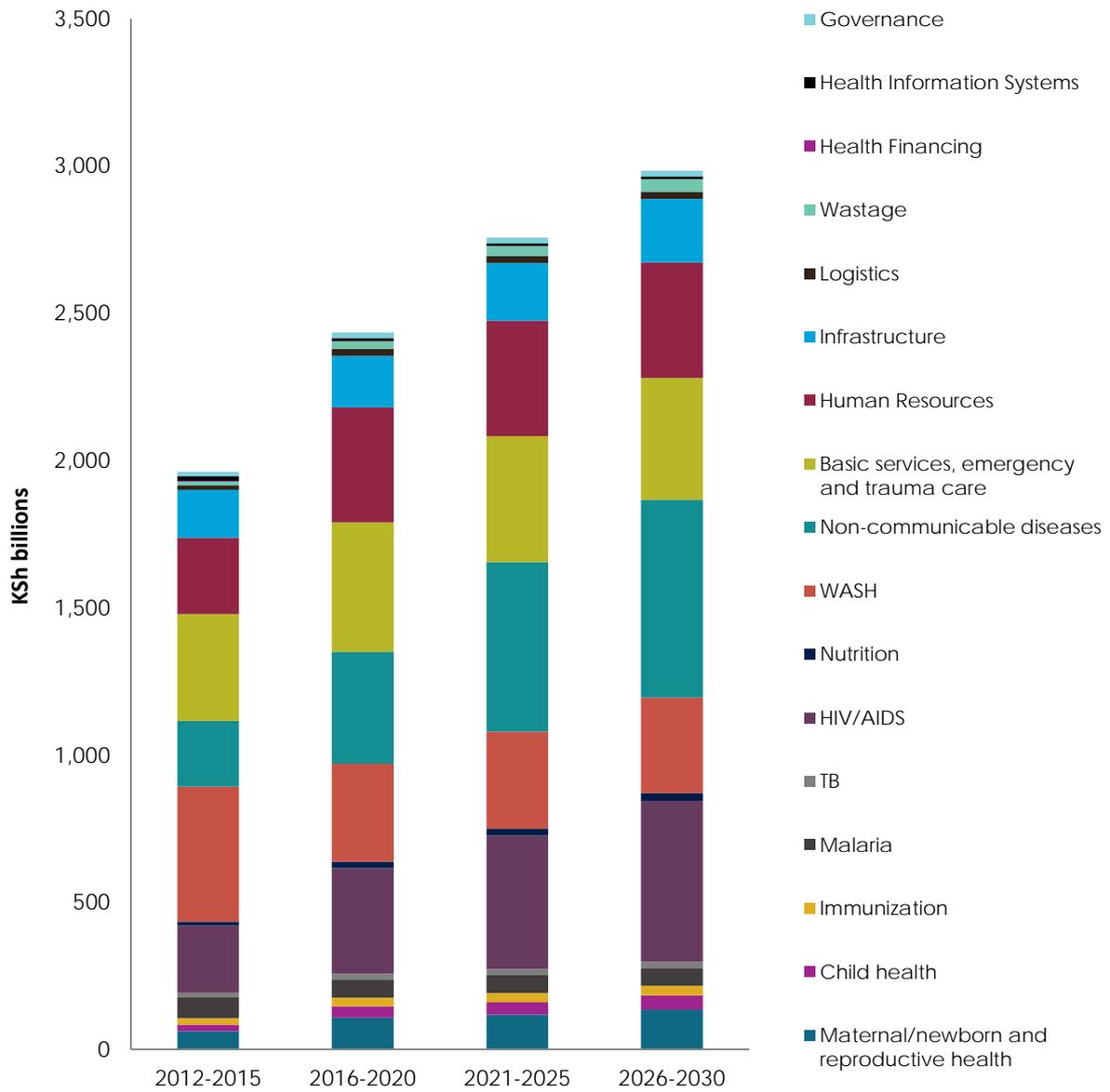
Figure A3.2. Prevalence of Diabetes, Pessimistic Scenario, FYs 2013/14–2029/30  
(including base FY 2012)



Source: Authors

Evidence also suggests that drug resistance to TB and HIV will increase in developing countries in the near future (Marais et al., 2013; Dye et al., 2013). Under the Pessimistic scenario, multi-drug-resistant TB notification will increase from 2.4 to 5 percent among new TB cases and from 9.8 to 15 percent for re-treatment cases from FY 2017 to FY 2030. Meanwhile, the portion of adults on ART who receive second-line ART will increase from 4.6 percent in FY 2017 to 10 percent in FY 2030.

Figure A3.3. Health Sector Cost, Pessimistic Scenario, FYs 2013/14–2029/30 (including base FY 2012)



Source: Authors

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