Health Research and Development Investment in Kenya

Commissioned by

PATH

Implemented by

E&K

ACKNOWLEDGMENTS

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ABBREVIATIONS

CHReaD	Coalition for Health Research and Development
COHRED	Council on Health Research for Development
CSO	Civil Society Organization
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on Research and Development
GGHE	General Government health expenditure
GoK	Government of Kenya
KEMRI	Kenya Medical Research Institute
KEMSA	Kenya Medical Supplies Authority
KENIA	Kenya National Innovation Agency
KMTC	Kenya Medical Training College
KNH	Kenyatta National Hospital
KUTRRH	Kenyatta University Teaching, Research, and Referral Hospital
MDAs	Ministries, State Departments, and Agencies
MOE	Ministry of Education
MOH	Ministry of Health
MTEF	Medium Term Expenditure Framework
MTRH	Moi Teaching and Referral Hospital
NACC	National AIDS Control Council
NACOSTI	National Commission for Science, Technology and Innovation
NCI-K	National Cancer Institute of Kenya
NESSP	National Education Sector Strategic Plan 2018–2022
NGO	Non-governmental Organization
NHIF	National Hospital Insurance Fund
NHRC	National Health Research Committee
NRF	National Research Fund
OCB	Office of the Controller of Budget
PBO	Parliamentary Budget Office
PCR	Polymerase Chain Reaction
R&D	Research and Development
SAGAs	Semi-Autonomous Government Agencies
SSA	Sub-Saharan Africa
ST&I	Science, Technology and Innovation
UON	University of Nairobi
WHO	World Health Organization

EXECUTIVE SUMMARY

Africa is home to 15 percent of the world's population and 25 percent of the global disease burden, yet it accounts for only one percent of the global investments in research and development (R&D) and two percent of the world research output[1]. The Government of Kenya, like the majority of governments in sub-Saharan Africa (SSA), has struggled to prioritize investments in health R&D and attain the quantum of investments it has committed to achieve. While the country made an ambitious commitment to allocate a third of its national research fund to health, the country has yet to achieve even a quarter of this commitment.

Analysis of data on health R&D investments, reported here, demonstrates that in 2019, the Government of Kenya managed to achieve, at most, 20 percent of its policy and fiscal commitment to invest in health R&D. Despite falling short of its health R&D investment commitments, relative to its peers in Africa, Kenya compares favorably in terms of health R&D investments as a proportion of national gross domestic product (GDP). This report finds that between 2017 and 2019, Kenya invested the average equivalent of 0.1 percent of the country's GDP in health R&D, which is a higher rate than investments from South Africa, Nigeria, or Uganda.

The evidence presented in this report further shows that government funding for health R&D is not only limited but is also often used to meet administrative costs at research centers rather than funding direct health R&D costs. The relatively higher direct costs of health R&D are, almost entirely, financed by donor funding. The relatively small government financing in direct health R&D costs is in spite of empirical evidence showing the direct correlation between economic growth and increased quantum of R&D investments.[2]

This report, commissioned by PATH, analyzes the investments made by the Government of Kenya into health R&D. The analysis reports the level of investment committed by the national government; amounts budgeted for by the relevant ministries, agencies, and departments; amounts appropriated by the government's legislative arm; and amounts expensed by the ministries, agencies, and departments as health R&D related expenditures. Further, the report looks at the qualitative aspects of health R&D investments to understand the kind of health R&D work that has been funded, and compares health R&D investments in Kenya to investments made by other African governments.

These findings demonstrate the importance of developing an investment case for health R&D to support future advocacy aimed at enhancing investments in Kenya. The report also recommends policy and fiscal interventions to enhance the local research workforce and capacity and to increase research collaborations across sectors and countries. For example, developing and hosting a data warehousing mechanism (e.g. a repository) within the health R&D space would link funding to research outputs and produce information that could be leveraged for advocacy around Kenyan government investments.

[1] Schemm Y. Africa doubles research output over past decade, moves towards a knowledge-based economy. Research Trends. 2013;35:1–4.
[2] Şahin BE. The relationship between R&D expenditures and economic growth: Panel data analysis 1990-2013. EY International Congress on Economics II (EYC2015), November 5-6, 2015, Ankara, Turkey 207, Ekonomik Yaklasim Association.

1. INTRODUCTION TO HEALTH RESEARCH AND DEVELOPMENT

Research and development (R&D) in health brings forth new technologies which have enhanced health solutions around the world. The development of these health technologies and sciences has been enabled by funding support received from governments, development partners, and philanthropic organizations that seek to support health research with the aim to ensure preparedness and advance global response to health challenges.

According to the Health Act of 2017—a key legislation governing the Kenyan health sector—health research and development refers to activities that seek to contribute to the extension of knowledge in any health related field, or the development of new technologies to improve health outcomes.

> "To support the extension of knowledge in any health related field, such as that concerned with the biological, clinical, psychological or social processes in human beings improved methods for the provision of health services; or human pathology; or the causes of disease; or the effects of the environment on the human body; or the development or new application of pharmaceuticals, medicines and other preventative, therapeutic or curative agents; or the development of new applications of health technology." [3]
>
> ***- Health Act of 2017***

The purpose of this report is to provide a deep-dive into the funding landscape of health R&D in Kenya. The report is structured such that it first looks at the policy and governing landscape of health R&D. Thereafter, the report analyses the funding landscape by looking at the commitments made by the Kenyan Government in support of health R&D; the amounts budgeted by the relevant ministries, state departments, and agencies (MDAs) for this function; amounts approved and allocated into the MDAs; and eventually amounts reported as receipts from the national exchequer account to finance health R&D. For the most part, the report presents a time series of the different data groups, and an analysis of the funding landscape. The final section of the report presents recommendations that merit consideration by the Kenyan Government, MDAs, and advocacy groups to enhance the policy and fiscal prioritization of health R&D in the country.

Scope and rationale of report

While investments for health R&D may come from multiple sources including external aid, this report focuses only on the funding stemming from the Kenyan Government and channeled through public sector institutions. The report focuses on funding activities from two sectors: health and education, as they are the ones closely linked to biomedical science research formulation and/or implementation in Kenya. Later in the report, results of a cross-country comparison are presented to give an account of how Kenya fares relative to other countries in Africa. The selection of countries in this comparative analysis is, in part, based on availability of relevant data.

[3]The Health Act. Kenya Gazette Supplement, No. 101. 23 June 2017. http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/HealthAct-No.21of2017.pdf.

2. POLICY LANDSCAPE AND GOVERNANCE OF HEALTH RESEARCH AND DEVELOPMENT

2.1. Policies governing health research and development

Health R&D is guided by a set of policies, legislation, and regulations which collectively strive to not only regulate but also encourage innovation and investment. While global and regional regulations and agreements exist, health R&D in Kenya is primarily guided by national level policies and legislation which range from the country's constitution to specific Acts of Parliament.

a) The Kenyan Constitution

The Constitution gives every Kenyan the right to the highest attainable standard of health and recognizes the role of science and indigenous technologies in the development of the nation.[4] While the Constitution devolves key functions and services to the county governments, functions related to research institutions, national referral health facilities, and health policies are all retained with the national government.

b) Kenya Vision 2030

Vision 2030 is Kenya's long-term development blueprint that seeks to transform the country into a globally competitive and industrialized middle-income economy by 2030. The vision blueprint promotes health R&D by directing the promotion of local research and innovation of health products and technologies to secure availability of quality drugs and commodities for provision of health services.

c) Health Act 2017

The Health Act 2017 is an Act of Parliament that establishes a unified health system, coordinates the inter-relationship between the national government and county government health systems, and provides the regulation of health care services, health care service providers, and health technologies. The Act sets the premise for health R&D in Kenya by (1) defining the scope of health R&D, (2) establishing the National Health Research Committee whose core mandate is the development of the national health research priority areas, and (3) giving the National Research Fund (NRF) the mandate to allocate not less than 30 percent of its funds to health R&D. [5]

d) Kenya Health Policy 2014–2030

The Kenya Health Policy (2014–2030) is designed to focus on two key obligations of the national government in matters of health: (1) realize the fundamental human right to health as enshrined in the Constitution of Kenya 2010 and (2) contribute to the economic development as envisioned in Vision 2030. The Policy structures the health sector into eight arms which collectively work together to attain the Policy's objectives. Research and Development is the eighth arm established in the Policy; it seeks to identify health priority areas and support evidence-based policy formulation and interventions by the Ministry of Health. [6]

e) Science, Technology and Innovation Act 2013

The Science, Technology and Innovation (ST&I) Act 2013 was established through an Act of Parliament to facilitate the regulation of technology and innovation and assign priority to the

[4] The National Council for Law Reporting. The Constitution of Kenya, 2010. http://extwprlegs1.fao.org/docs/pdf/ken127322.pdf.
[5] The Health Act. Kenya Gazette Supplement, No. 101. 23 June 2017. http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/HealthAct-No.21of2017.pdf.
[6] Ministry of Health, Republic of Kenya. Kenya Health Policy 2014–2030. 2014. http://publications.universalhealth2030.org/uploads/kenya_health_policy_2014_to_2030.pdf.

development of science, technology, and innovation. Before its amendment, the ST&I Act was called the Science and Technology Act of 1979; it established the Kenya Medical Research Institute (KEMRI) as the national body in-charge of carrying out health research in Kenya. The current Act (ST&I Act of 2013) has established the National Commission for Science, Technology and Innovation (NACOSTI), the Kenya National Innovation Agency (KENIA), and the National Research Fund (NRF), all of which, as will be described later, play an active role in enhancing the R&D space in Kenya. [7]

f) Research-For-Health Policy Framework 2019–2030

The Research for Health Policy Framework 2019–2030 provides guidance and structure on how the national research for health ecosystem in Kenya will align to the governing legislative documents such as the Kenyan Constitution, the Kenya Vision 2030, the ST&I Act 2013, and the Health Act 2017. [8]

g) Research-For-Health Priorities 2019–2023

The Research for Health Priorities 2019–2030 document provides guidance on the allocation of resources from governmental and development agencies to the prioritized health research areas in Kenya. [9]

h) National Education Sector Strategic Plan 2018–2022

The National Education Sector Strategic Plan (NESSP) 2018–2022 outlines policies, programs, and strategies for the Ministry of Education (MOE). The programs are related to different sectors including Quality Assurance and Standards, National Qualifications Framework, ST&I, and education at all levels. The plan aims at increasing governance and accountability in education and research. It recognizes the role of ST&I as an enabling factor for the development goals in line with Vision 2030. [10]

i) African Union Pledge 2007

The African Union called upon member states to empower local research institutions by increasing the allocation of local funding for research and innovation to at least one percent of the national GDP. The continental average currently stands at 0.5. percent, compared to a world average of 2.2 percent. [11]

j) World Health Assembly

The 58th World Health Assembly held in Geneva in 2005 called on governments to budget at least 2 percent of national health expenditures and at least 5 percent of external aid for health projects and programs into the strengthening of national health research systems.[12]

[7] The National Council for Law Reporting. Science, Technology and Innovation Act, No. 28 of 2013. 2014. https://www.nacosti.go.ke/images/docs/2018/november/Science-Technology-and-Innovation-Act-No.-28-of-2013.pdf.
[8] Republic of Kenya. Research-For-Health Policy Framework 2019–2030. Nairobi; 2019.
[9] Republic of Kenya. Research-For-Health Priorities 2019–2023. Nairobi; 2019.
[10] Ministry of Education, Republic of Kenya. National Education Sector Strategic Plan for the Period 2018–2022. 2018. https://www.globalpartnership.org/sites/default/files/document/file/kenya-nessp-2018-2002.pdf.
[11] United Nations Economic Commission for Africa (ECA). ECA Policy Brief. No. ECA/18/004. Addis Ababa, Ethiopia: ECA; 2018. https://www.uneca.org/sites/default/files/PublicationFiles/eca_policy_brief_beyond_funding-_the_research_and_development_rev1.pdf.
[12] World Health Organization (WHO). Fifty-Eighth World Health Assembly: Geneva, 16–25 May 2005. WHA58/2005/REC/1. Geneva: WHO; 2005. https://apps.who.int/gb/ebwha/pdf_files/WHA58-REC1/english/A58_2005_REC1-en.pdf.

2.2. Governance structure in health research and development

The Government of Kenya is involved in health R&D through three arms: (1) the national government ministries of health and education, (2) the autonomous and semi-autonomous government agencies (SAGAs) under the ministries of health and education, and (3) the research institutions established under the Universities Act. The role of the ministries is to ensure adequate funding is allocated and received by the health R&D institutions under their mandate. The SAGAs under the Ministry of Health (MOH) have the mandate to formulate the agenda for health research, whereas the research institutions under MOE have the mandate to execute the research in accordance with the ethical code of conduct for health research prescribed in the ST&I Act of 2013 **(Figure 1).**

Figure 1: Governing structure in health research and development

Governing Acts	Health Act 2017	Science, Technology and Innovation Act 2013
Established from the Act	Research budget for health Mandates NRF to allocate 30 percent of its funds to finance this budget	NRF, NACOSTI, KENIA
Oversight bodies	Ministry of Health	Ministry of Education
Implementing bodies	SAGAs in health sector (e.g. KEMRI)	Research institutions (e.g. University of Nairobi)
Enablers	National Treasury	

About autonomous and semi-autonomous government agencies in the health sector

KEMRI is a national body in Kenya mandated to carry out research on human health. It is the only SAGA under the MOH whose core mandate is to explore health research and development. A significant amount of the health R&D budget, therefore, flows into this parastatal. Other SAGAs under the MOH are Kenyatta National Hospital (KNH); Moi Teaching and Referral Hospital (MTRH); Kenyatta University Teaching, Research, and Referral Hospital (KUTRRH); Kenya Medical Training College (KMTC); Kenya Medical Supplies Authority (KEMSA); National Hospital Insurance Fund (NHIF); National AIDS Control Council (NACC); and National Cancer Institute of Kenya (NCI-K). They all complement MOH in discharging its core functions through specialized health service delivery including medical research and training.

About autonomous and semi-autonomous government agencies in the education sector

The education sector has 25 SAGAs, of which three have demonstrated participation in programs related to research and development. These are the National Research Fund (NRF); the National Commission for Science, Technology and Innovation (NACOSTI); and the Kenya

National Innovation Agency (KENIA). Despite their separate mandates, they collectively contribute to the national research and development agenda **(Table 1):** [13]

- NRF is mandated to facilitate research for the advancement of ST&I. NRF provides post-graduate research grants to individuals and institutions aimed at establishing links between R&D sectors as well as grants that target research infrastructures. NRF's strategic partnerships in innovation policy programs have also been beneficial to the state through co-funding research.

- NACOSTI has the mandate to regulate and assure quality in the ST&I sector and advise the government on related matters. NACOSTI has overseen registration of all research organizations in Kenya, which has resulted in strengthened regulatory mechanisms in the country.

- KENIA is mandated to develop and manage the National Innovation System through various tasks including institutionalizing linkages between universities, research institutions, the government, and the private sector. It oversees the funding of innovations.

Table 1: Education sector SAGAs with mandates on research and development

Institution	**National Research Fund**	**National Commission for Science, Technology and Innovation**	**Kenya National Innovation Agency**
Mandate	To facilitate research for the advancement of science, technology, and innovation	To regulate and assure quality in the sector and advise the government	To develop and manage the National Innovation System
Establishment Act	Science, Technology and Innovation Act 2013		
Funded by	Treasury through MOE *(ideally, Treasury should allocate 2 percent of the country's GDP to the fund)*	Treasury through MOE	Treasury through MOE
Role in health R&D	At least 30 percent of the fund is allocated to the health research budget	Strengthens regulatory mechanisms for R&D thereby enabling advancement of health research; also has the mandate to promote the adoption and application of research insights in attaining development goals for Kenya	Fosters linkages between research institutions and oversees funding thereby enabling health R&D

However, as per the Kenya Health Policy 2014–2030, actual implementers of the research and development agenda are institutions such as universities. This report therefore, took into account the amounts received by universities that housed a health science faculty. These were the University of Nairobi, Kenyatta University, and Moi University. [14]

[13] The National Council for Law Reporting. Science, Technology and Innovation Act, No. 28 of 2013. 2014. https://www.nacosti.go.ke/images/docs/2018/november/Science-Technology-and-Innovation-Act-No.-28-of-2013.pdf.
[14] Because the learning institutions are expected to distribute their R&D allocations across projects in sectors other than health, it is expected that the amounts indicated relative to MOE are an overestimate of the funds used in health R&D.

3. METHODOLOGICAL APPROACH

Insights on health R&D investments in Kenya presented here were gathered through two key methodologies—review of existing data and literature and consultations with relevant stakeholders and opinion leaders. The review of existing data and literature considered numerous reports, databases, and independent studies that are summarized in **Table 2.**

Table 2: Illustrative list of databases, reports, and resources used as data sources

Report or database	Health R&D information obtained
Health Act 2017	Regulations governing health R&D in Kenya and the size and funding sources of the health research budget
Science, Technology and Innovation Act 2013	Establishment and funding sources for the National Research Fund
National Commission for Science, Technology and Innovation (NACOSTI) database	Given NACOSTI's mandate to oversee all R&D projects in Kenya, this database was explored to identify details of the health R&D projects in the time period under review
Medium Term Expenditure Framework – health sector	Amounts budgeted and allocated for health R&D by the Ministry of Health
Medium Term Expenditure Framework – education sector	Amounts budgeted and allocated for health R&D by the Ministry of Education
Audited accounts of the relevant ministries, state departments, and agencies	Amounts received from the national exchequer account following the passing of an appropriation bill approving allocations for health R&D
PubMed	Search engine for published reports on life science and biomedical topics

Stakeholder consultations were guided by gaps in knowledge identified through the review of existing data and literature and involved administering semi-structured interviews to stakeholders who were identified though a stakeholder mapping exercise as well as snowballing techniques[15]. Institutions consulted were: KEMRI, NACOSTI, NRF, MOH, Kenyatta University, Moi University, University of Nairobi, MTRH, and the National Treasury.

Findings on investments in health R&D were categorized and reported in three sequential levels that are aligned to the flow of funds for health R&D in the public sector in Kenya, from policy commitments to actual spending by the SAGAs and research institutions. These are:

- **Level 1:** This constituted the policy commitments established by the ST&I Act. The data used to establish this were the national GDP levels and the ST&I 2 percent allocation, and the Health Act's 30 percent allocation.

- **Level 2:** This constituted the funding requirements and subsequent allocations as outlined in the sectoral Medium Term Expenditure Framework (MTEF).

- **Level 3:** This constituted the actual funding receipts reported to have been received by the SAGAs and research institutions.

[15] Naderifar M, Goli H, Ghaljaie F. Snowball sampling: A purposeful method of sampling in qualitative research. Strides Dev Med Educ. 2017;14(3):e67670. doi: 10.5812/sdme.67670.

4. FUNDING LANDSCAPE FOR HEALTH RESEARCH AND DEVELOPMENT IN KENYA

4.1. Amount of funds that the Government of Kenya has committed to invest in Health R&D

The Kenyan government demonstrated its commitment to R&D through the enactment of the Science, Technology and Innovation Act of 2013, which establishes the National Research Fund as the funding source for the national research budget for health.

> "Having regard to the necessity of both scientific and policy research in the field of health in Kenya, a portion of not less than thirty per cent of the National Research Fund shall be allocated for health research."
>
> ***- Health Act of 2017***

The Health Act mandates the NRF to allocate at least 30 percent of its funds to the national research budget, to support the promotion and execution of health research. **Table 3** demonstrates the amounts expected in the research budget for the years 2017 to 2019 based on the previous year's national GDP and the allocated proportions informed by the ST&I and Health Acts [16]. In this report, we refer to these amounts as the commitment amounts. The steady rise from US$415 to US$527 is due to growth in GDP and is not an actual increase in proportion of commitment.

Table 3: Funds committed by Government of Kenya for health R&D (USD, million)

	2017	2018	2019
Government's commitments (USD, million)	415	473	527

Source: World Bank Group's Kenya GDP data; E&K analysis.
Note: Commitment refers to the amounts prescribed by the Health Act to finance the national research budget for health.

As prescribed by the ST&I Act, NRF funds are expected to come from multiple sources including:

- Two percent of the country's GDP;
- Amounts designated for the fund by Parliament;
- Monies received from research licensing fees;
- Donations, endowments, grants, and gifts received for the purpose of research.

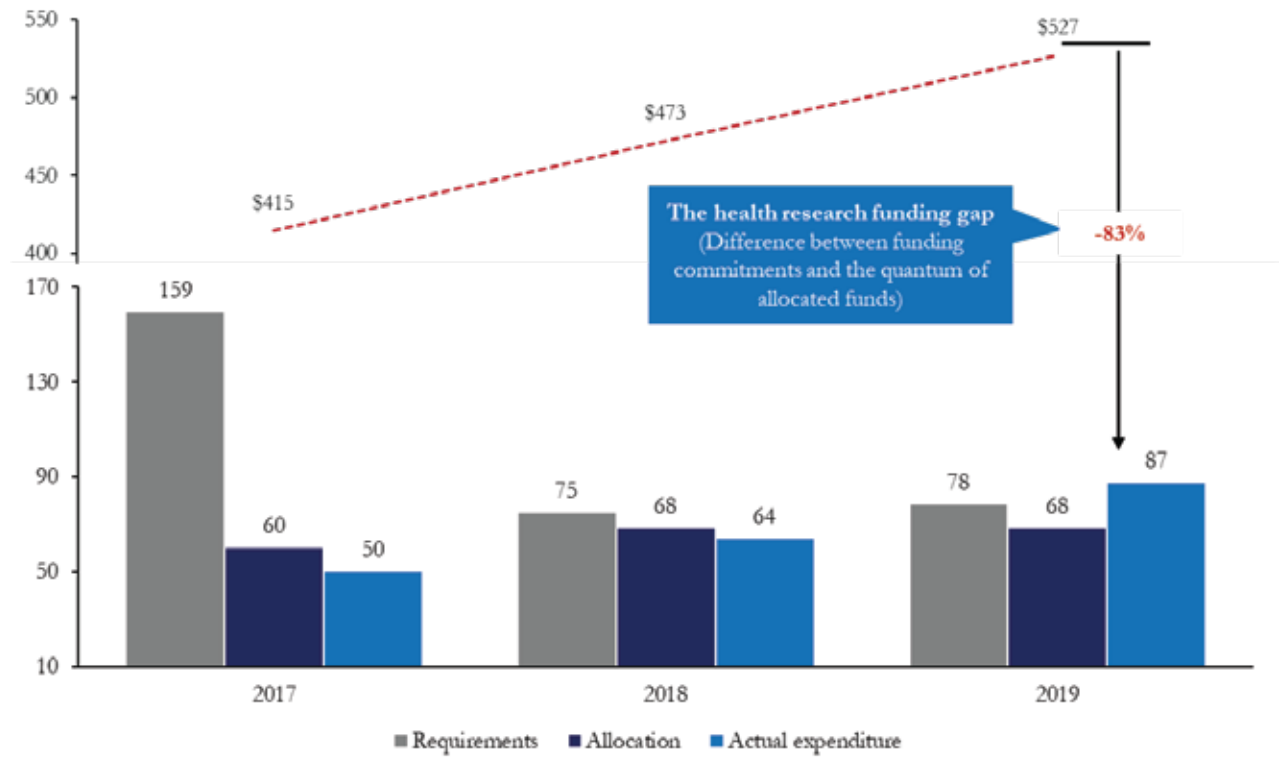
However, despite the multiple sources of funding, consultations revealed that over 90 percent of NRF funding was sourced from the Government of Kenya, with the remainder coming from bilateral sources. [17]

[16] Due to limitations in accessing data for the National Research Fund, the report and hence, Figure 2, does not take into account the other constituents of the NRF (i.e. listed as ii–iv). It is however expected that the 2 percent proportion of GDP would be the largest single constituent of the NRF.
[17] Insights obtained from key informant interviews.

The actual amount of funds budgeted and eventually allocated for health R&D has consistently fallen far below the quantum that the Government of Kenya committed to provide.

Temporal analysis of the amount of funds budgeted and eventually allocated for health R&D shows that these funds have consistently fallen below the amounts the Government of Kenya has committed to invest, either through policy or legislation. Data from 2019 show that the disparity between the committed amounts and the actual allocation is as high as 83 percent **(Figure 2)**. While the quantum of resources that the Government of Kenya has committed to invest in health R&D is computed solely based on 2 percent of GDP (i.e. not taking into account other constituents of the funds, such as licensing fees, due to lack of reliable data on these other constituents), it is likely that the contribution of other sources of funds is marginal and as such the inference that actual expenditure in health R&D falls far below government's commitment quantum is valid.

Figure 2: Government's commitment relative to budgeted and allocated funding for health R&D (USD, million)



Source: Ministry of Health (MOH) and Ministry of Education (MOE) 2019 Medium Term Expenditure Framework (MTEF) reports; E&K analysis.
Note: The amounts represent a sum of amounts documented in the MTEF reports for MOH and MOE.
Note: **Commitment** refers to the amounts prescribed by the Health Act to finance the national research budget for health; **Requirements** refer to the amounts recommended by MOE and MOH to finance their planned R&D activities. This is as reported in the respective MTEF reports. **Allocation** refers to the amounts set aside by the national government to finance ministries' R&D activities. This is as reported in the respective MTEF reports. **Actual expenditure** refers to the total of amounts reported in the MTEF as Programme 3 - Health Research and Development for Health sector and 25 percent of the amounts in Programme 2 - Research, Science, Technology and Innovation programme for Education sector.
Note: The National Research Fund reported that between the years 2013 and 2018, 25 percent of the fund size was allocated to Health sciences. This report therefore assumes that 25 percent of MOE's R&D requirement, allocation, and actual expenditure is attributable to health R&D.

As illustrated in Figure 3, the amount of funds eventually allocated for health R&D is nearly 80 percent less than the quantum of resources that the Government of Kenya committed to provide for health R&D.

4.2. Budget requirements for health research and development

Budgeting for health R&D falls under the mandate of the MOH. The budget is presented in the MTEF report, which undergoes the standard budget making process before funds can be disbursed.

In 2010, the Constitution of Kenya devolved some health functions from the national to the county governments. While the counties were tasked with health care service provision, the national government, through its MDAs, maintained the policy and fiscal mandate over health R&D.

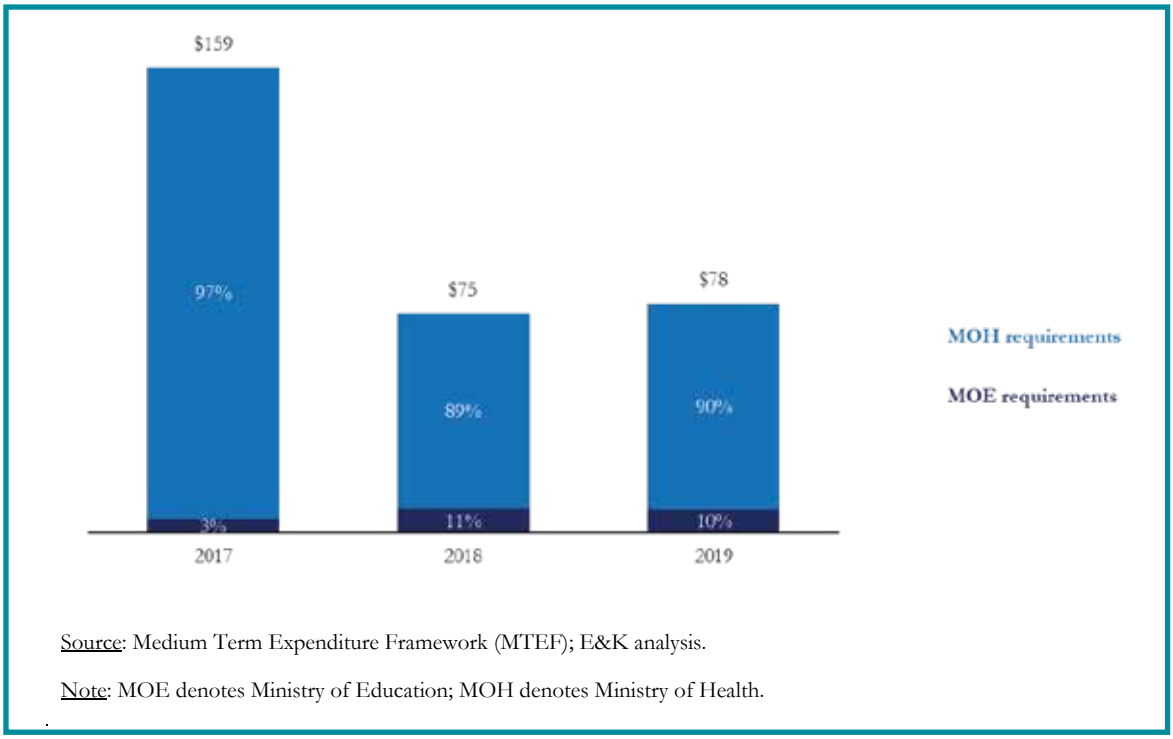
The Health Act established a National Health Research Committee (the Committee) to recommend prioritization areas for health research and ensure resource mobilization from NRF. This Committee reports to the Division of Monitoring and Evaluation, Health R&D and Health Informatics within the Department of Policy Planning and Health Financing at the MOH. In light of this, the mandate of budgeting for health R&D falls, in part, under the MOH. The quantum of funds set out as budgetary requirements for health R&D are defined in the MTEF report, which serves as a three-year rolling budget framework. Right from the formulation of the MTEFs to the audit of disbursed funds, MOH and MOE go through a standard budget making process that allows them to allocate and contribute to Kenya's health R&D **(Figure 3)** [18].

Source: The Parliament of Kenya; E&K illustration.

Temporal analysis reveals that the bulk of health R&D budgetary requirements are documented under the MOH, with MOE accounting for 3 to 11 percent of the budgetary requirements (Figure 4). It is important to note that budgetary requirements documented under the MOE refer to the portion earmarked for health R&D from the total requirements. This refers to 25 percent of the funds expensed to MOE for research that is specifically used for health sciences.

[18] Parliament of Kenya, National Assembly. The National Assembly and Budget Making. Fact sheet No. 29. 2018. http://www.parliament.go.ke/sites/default/files/2018-04/29_The_National_Assembly_and_Budget_Making.pdf. International Budget Partnership. Kenya: Are Sector Working Groups an Effective Mechanism for Public Participation? 2016,https://www.internationalbudget.org/wp-content/uploads/kenya-sector-working-groups-and-public-participation-2016.pdf.

Figure 4: Temporal trend in budgetary requirements for health research and development (USD, million)



Source: Medium Term Expenditure Framework (MTEF); E&K analysis.

Note: MOE denotes Ministry of Education; MOH denotes Ministry of Health.

4.3. Allocations to health research and development

The legislative arm of the Kenyan government has the mandate to review and amend the budgets presented to Parliament, and thereafter enact them into law.

As depicted in Figure 3, the second stage to the budget process is the approval stage, which is carried out by the National Assembly. After the relevant MDAs (including MOH and MOE) submit their budget estimates, the National Treasury carries out a review to ensure the budget proposals are in tandem with the medium-term priorities of the government. These priorities are currently governed by its 'Big Four' Agenda, which seeks to accelerate economic growth through enhancements in the health, housing, manufacturing, and agriculture sectors. The National Treasury would prioritize resource allocation to the programs and projects that serve as drivers and enablers of the national government's agenda.

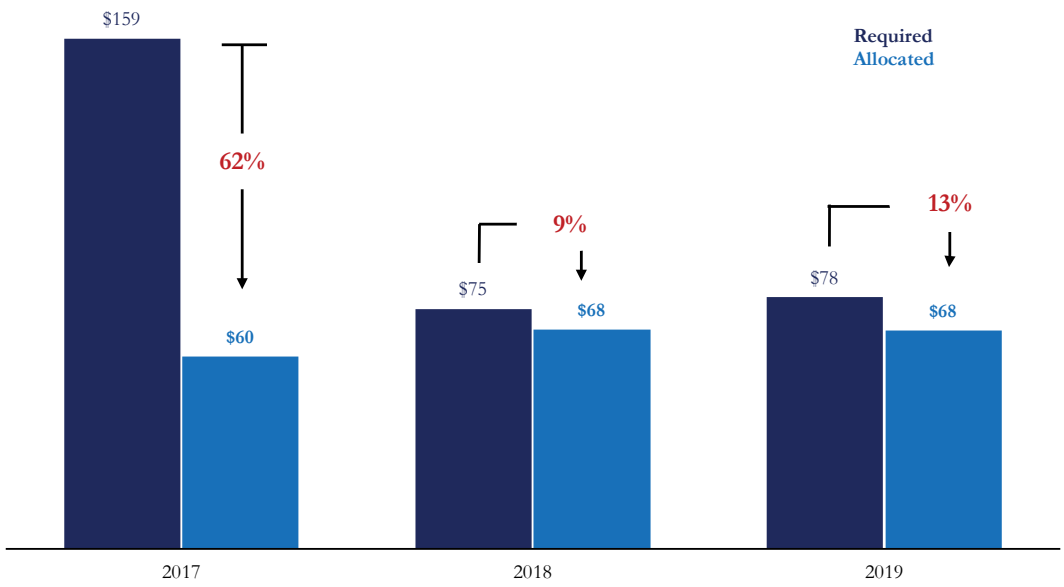
The quantum of funds allocated to health R&D has consistently fallen short of the budgetary requirements put forward by MOH and MOE (Figure 5). While this shortfall may reflect budget rationalization by the National Treasury, it may as well indicate that the prioritization of R&D as an enabler of the 'Big Four' Agenda is evident at policy but not at fiscal level and that the health pillar in the 'Big Four' is largely geared towards health care service provision[19].

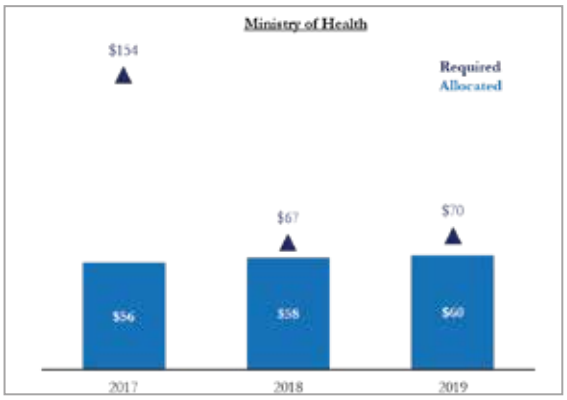
Although a majority of the health R&D budget goes to KEMRI, the funds are used to meet indirect expenses such as utility bills; actual health R&D costs are met by donor funds.

In 2018, inflows into KEMRI amounted to US$20 million, out of which US$2.6 million was sourced from the Government of Kenya. Consultations affirmed that in fact direct health R&D costs incurred by KEMRI are sourced from donors, with the government funding indirect costs that support the health R&D function, such as administrative costs. Expenditures by KEMRI also exceeded the amounts allocated from the exchequer account, indicating that external donors fund the majority of the health R&D and consequently dictate the research priorities of the institution.

[19] The health sector focus is mainly on the provision of universal health coverage.

Figure 5: Budgeted requirements versus funds allocated to MOH and MOE for research and development (USD, million)





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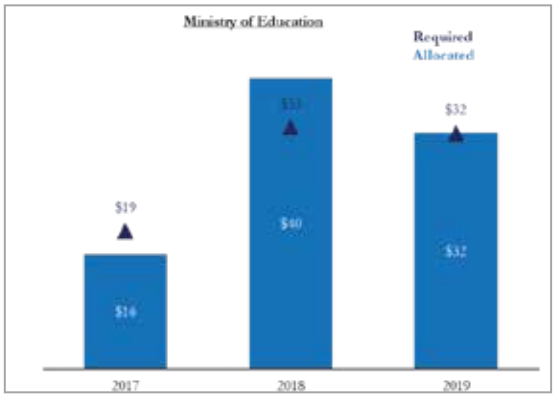


Source: Medium Term Expenditure Framework (MTEF); E&K analysis

Note: **Requirements** refer to the amounts recommended by the Ministry of Education (MOE) and Ministry of Health (MOH) to finance their planned R&D activities. **Allocation** refers to the amounts set aside by the national government to finance ministries' R&D activities. This is as reported in the respective MTEF reports. Allocated amounts are different from approved budgets.

In the Ministry of Health, 60 percent of the funds designated for health R&D are used to provide elementary training to medical students and have very little to do with actual health R&D; 40 percent of the funds are utilized in actual research and innovation.

4.4. Funding priorities for health research and development

The core mandate of the National Health Research Committee (NHRC), as stipulated in the Health Act, would be to identify and prioritize focus areas for health research.

> The Committee shall make recommendations on the development of the national research for health policy and on the various priorities to be accorded in the area of research for health in the light of current knowledge and needs, recognized priorities and economic resources.
>
> ***-Health Act of 2017***

In identifying the research priority areas, the NHRC would consider the following:

- The burden of disease;
- The cost-effectiveness of interventions aimed at reducing the burden of disease;
- The availability of human and institutional resources for the implementation of an intervention at the level closest to the affected communities;
- The health needs of vulnerable groups such as women, older persons, children, and people with disabilities;
- The health needs of communities;
- National security; and
- Emerging issues on health.

In Kenya, health research priority areas are communicated in the medium-term plans of the health sector. In the year 2018/19, for example, the MTEF report identified the following priority areas for health research:

- **Training:** The funds are used for infrastructural developments including the expansion of new campuses and increasing training institutions in order to increase the uptake levels and consequently increase research professionals;

- **Research literature:** Funds are used to support researchers in the health sector in order to bridge the knowledge gap and encourage contribution to innovative research;

- **Program development:** In addition to increasing training opportunities, R&D funds are used to develop and introduce new programs aimed at addressing emerging health needs;

- **Diagnostic and testing kits:** KEMRI uses research funds to produce and distribute testing kits to improve quality of diagnosis and supporting service delivery; and

- **Research support:** This involves supporting new research protocols, research projects, enrollment of graduate researchers, and diagnostics. Research projects that are funded cut across national research priority areas including universal health care, and some of the funds are injected into conferences such as the KEMRI Annual Scientific and Health (KASH) conference.

While the country's research priorities are guided by the medium-term plans, KEMRI's research priorities are guided by its strategic plan for the years 2018–2023 that builds onto the 2013–2017 plan. One of the key objectives of the institution over the plan period is the strengthening of

investment in health R&D. Some of the research priority areas are in research literature, vaccine trials, and development of diagnostic kits, among others. From 2013 to 2017, KEMRI implemented 60 percent of the planned activities. The following are some of KEMRI's key achievements in health R&D during that period[20]:

- Developed 970 new research proposals and published 1,101 journal articles, which contributed to increased scientific knowledge;
- Set up a national reference TB laboratory in Kisumu;
- Conducted malaria vaccine phase 3 trials (approved by the World Health Organization for rollout);
- Participated in the development of policy briefs and guidelines including the Kenya AIDS Indicator Surveys, Kenya Health Policy, and Kenya AIDS Strategic Framework;
- Collaborated with 66 researchers and development partners in development of research activities of public health concern;
- Developed and sold 169,835 diagnostic kits and other products including KEM-rub, TBcide, and Culture Media (tubes and plates);
- Provided 12,206 clinical services to clients seeking services at KEMRI clinics and conducted 508,645 laboratory tests to support approved disease surveillance activities; and
- Developed the KEMRI Bill, which enhances the coordination, conduct, and regulation of health R&D.

In the context of the unprecedented COVID-19 pandemic, KEMRI has had to shift its priorities to focus on the COVID-19 response. Some of the flagship projects and activities being undertaken by the institution include (1) whole genome sequencing, (2) evaluation of COVID-19 diagnostic kits, (3) testing of drug efficacy, (4) virus transport media production, (5) point of care kit production, (6) development of polymerase chain reaction (PCR) kits, (7) supporting the national testing for COVID-19 by providing testing infrastructure, and (8) vaccine development[21].

Despite the current COVID-19 situation, KEMRI's future research priorities are still deeply rooted in strengthening investment in research and innovation. During the 2018–2023 strategic plan period, KEMRI identified five focus areas: (1) research and innovation, (2) corporate governance, (3) research infrastructure, (4) KEMRI graduate school of health research, and (5) financial sustainability. The achievement of the research and innovation strategic objective will be pegged on the following key activities[22]:

- Development of a health research agenda. This will involve assessing research needs, participating in priority research agenda setting, training county health management teams on health research, and conducting engagement forums to develop and implement the priority research agenda.

[20] KEMRI, 2018. " Kenya Medical Research Institute Strategic Plan 2018-2023", https://www.kemri.org/wp-content/uploads/2019/10/FINAL-REVISED-STRATEGIC-PLAN-2019-1.pdf
[21] Kenya Medical Research Institute (KEMRI). Bulletin. Issue 16. 2020. https://www.kemri.org/wp-content/uploads/2019/11/Bulletin-Issue-16.pdf.
[22] KEMRI. Kenya Medical Research Institute Strategic Plan 2018–2023. 2018. https://www.kemri.org/wp-content/uploads/2019/10/FINAL-REVISED-STRATEGIC-PLAN-2019-1.pdf.

- Strengthening research approval and implementation mechanisms. This will be done through strengthening of research implementation oversight, reviewing and approving proposals, reviewing and implementing regulations for conducting research, and carrying out quality control in research.

- Conducting research for human health in priority areas. KEMRI will conduct research on universal health care, human food security and nutrition, health systems, immunology, proteomics, genomics, mental health, and substance abuse. Further, the institution will establish drug discovery or pharmacovigilance biosimilar research.

- Strengthening research translation and knowledge management. This will be achieved through organizing conferences and workshops, publishing manuscripts, presenting research findings in scientific forums, and training researchers.

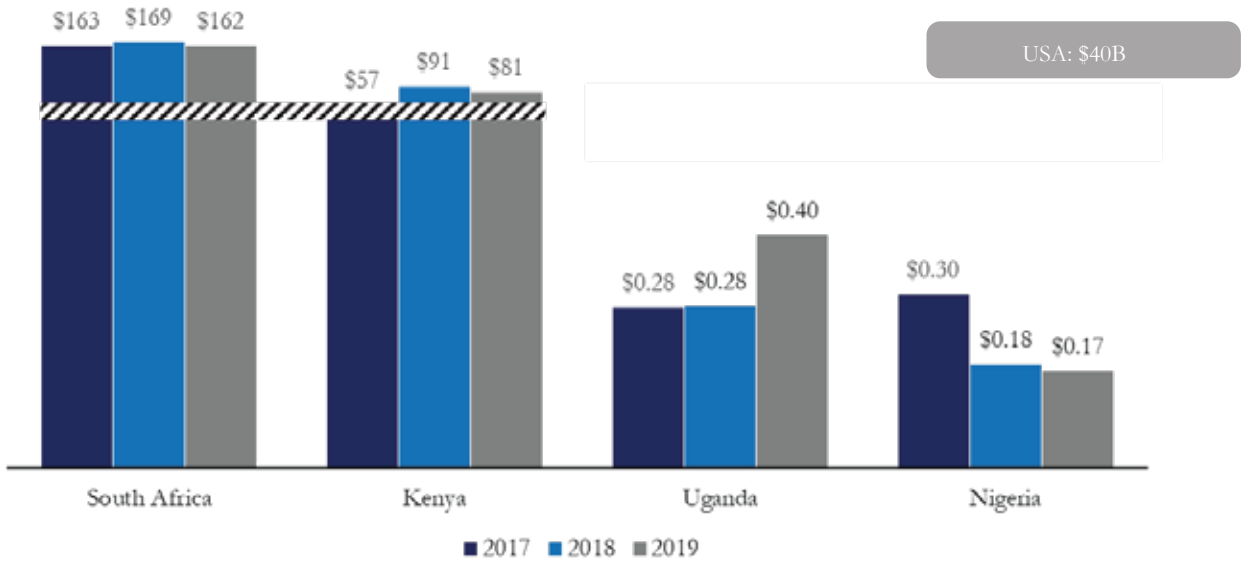
5. A CROSS-COUNTRY ANALYSIS OF HEALTH RESEARCH AND DEVELOPMENT INVESTMENTS

This section will compare the health R&D investments of Kenya relative to that of South Africa, Uganda, and Nigeria. These health R&D investments will be compared in absolute amounts, as proportions of their general government expenditure in health, and as proportions of their GDP. Additionally, the countries' general R&D expenditures will be compared as proportions of their GDP.

5.1. Cross-country comparison of health research and development investments in absolute terms

In absolute dollar terms, the Kenyan Government's health R&D investment compares favorably to other African governments. Cross-country comparison shows that the South African and Kenyan governments invest comparatively more towards health R&D compared to other countries such as Nigeria and Uganda. It is worth noting that there are huge disparities in investments in health R&D by different African governments. For instance, South Africa's annual investment in health R&D between 2017 and 2019, which averages about US$160 million, exceeds the combined investment made by Kenya, Uganda, and Nigeria over the same period **(Figure 6).** At a global level, health R&D investments by African governments compare poorly to investments made by the United States, the global leader in medical research[23]. For instance, in 2017, the US government invested US$40 billion in health R&D[24].

Figure 6: Cross-country comparison of health research and development in absolute terms (USD, million)

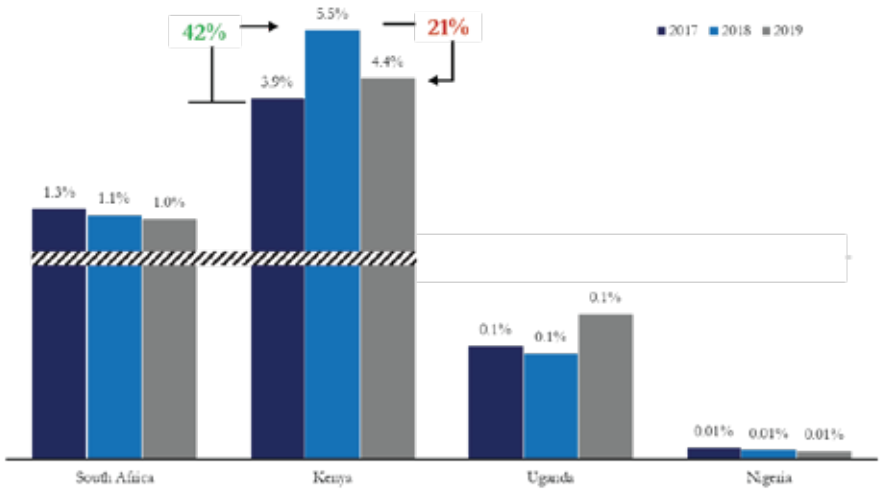


Source: Varied; E&K analysis.
Note: The amounts represent health R&D allocations for South Africa, Kenya, Uganda, and Nigeria.

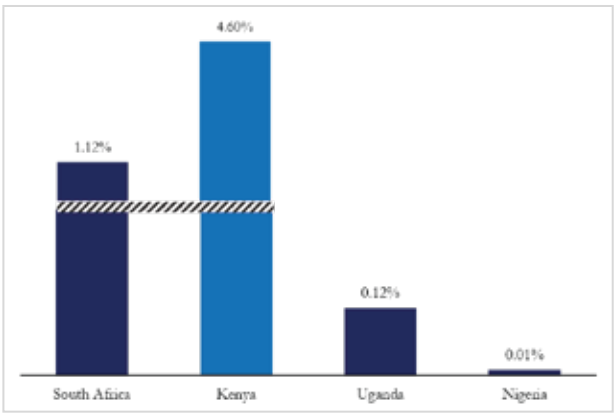
5.2. Cross-country comparison of health research and development investments as a proportion of government health expenditure

While investments made by a government in health R&D in absolute dollar terms gives some perspective on the quantum of health R&D investments, health R&D expenditure as a proportion of general government expenditure in health (GGHE) may give an indication of a government's prioritization of R&D relative to other, often competing needs in the health sector. Whereas South Africa invests nearly twice as much as Kenya does in health R&D in absolute dollar terms, a comparison of health R&D investments relative to total general government health expenditure (GGHE) suggests that the Kenyan Government prioritizes R&D more than the governments of South Africa, Uganda, and Nigeria **(Figure 7).**

Figure 7: Cross-country comparison of health research and development investments as a proportion of general government health expenditure



Three-year average (2017–2019)



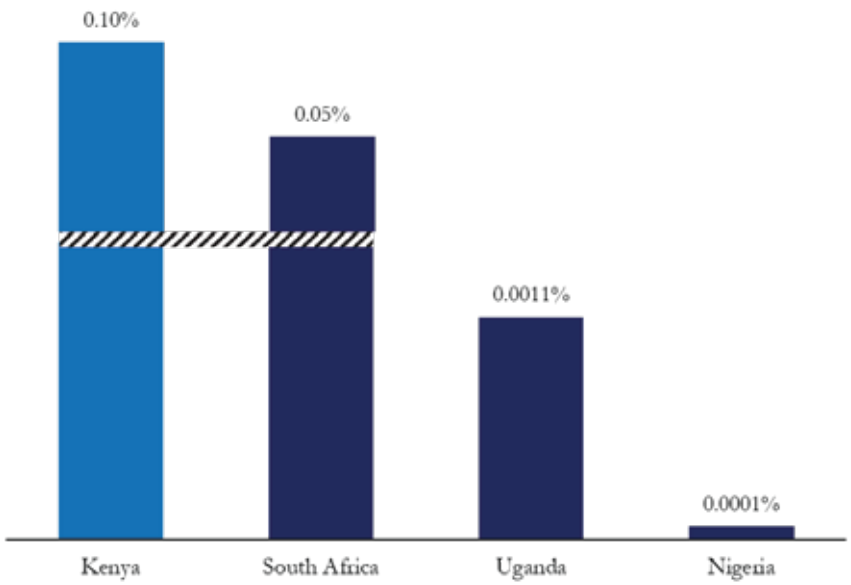
Source: Varied; E&K analysis.
Note: The percentages shown represent an average of the percentages for 2017, 2018, and 2019. Health R&D investments refers to the amounts indicated in the Medium Term Expenditure Framework (MTEF) reports as allocations for Health R&D.

[23]Radu S. U.S., China compete for medical research leadership. U.S. News and World Report. Sept 27, 2019. https://www.usnews.com/news/best-countries/articles/2019-09-27/china-threatens-the-us-leadership-position-in-medical-research#:~:text=From%20vaccines%20to%20medical%20devices,particularly%20China%2C%20threaten%20that%20standing.
[24]Research America. U.S. Investments in Medical and Health Research and Development 2013–2017. Arlington, Virginia; 2018. https://www.researchamerica.org/sites/default/files/Policy_Advocacy/2013-2017InvestmentReportFall2018.pdf.

5.3. Cross-country comparison of health research and development investments as a proportion of national GDP

While investments made by a government in health R&D in absolute dollar terms gives some perspective on the quantum of health R&D investments, health R&D expenditure as a proportion of national GDP gives an indication of a country's investment in health R&D relative to its economic performance. Using this metric, the Kenya Government invests the equivalent of 0.1 percent of the country's GDP in health R&D—which compares favorably relative to South Africa, Nigeria, and Uganda (Figure 8).

Figure 8: Cross-country comparison of health research and development investments as a proportion of national GDP

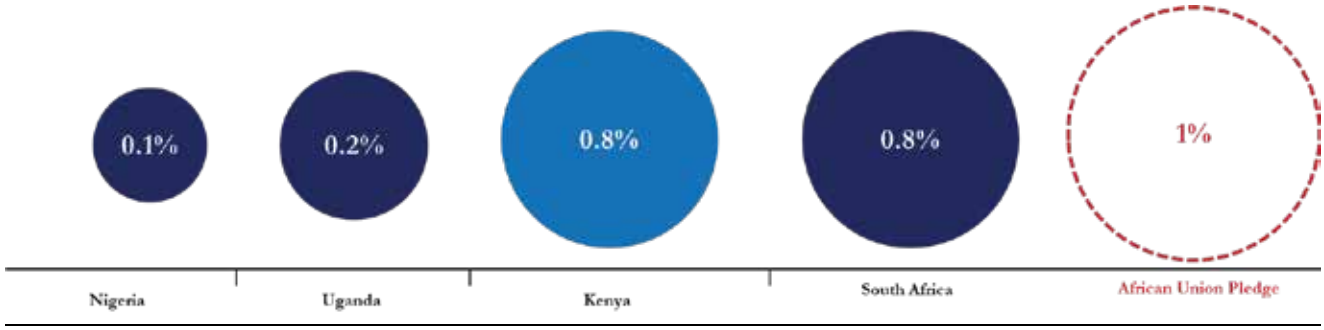


Source: Varied; E&K analysis.
Note: The percentages presented represent an average of the percentages for 2017, 2018, and 2019. Health R&D investments refers to the amounts indicated in the Medium Term Expenditure Framework (

Comparative analysis of the general research and development expenditure as a proportion of national GDP

Analysis of investments in R&D in general (i.e. rather than specifically of health R&D) shows that, in general, investments in R&D by African governments is low. For instance, investment in R&D by the governments of South Africa, Kenya, Uganda and Nigeria falls below the 1 percent of national GDP threshold that African governments committed to at a meeting of the Africa Union (Figure 9).

Figure 9: Cross-country comparison of general research and development expenditure as a proportion of national GDP



Source: Varied; E&K analysis.
Note: The percentages were accessed in June 2020 from UNESCO Institute of Statistics.[1] The percentages are as at an unidentified point in time.

Taken together, the cross-country comparative analysis of health R&D investments shows that, in absolute terms, South Africa invests significantly more in health R&D compared to Kenya, Uganda, and Nigeria. However, in relative terms, Kenya's investment in health R&D as a proportion of GGHE and GDP is highest among the four countries. Overall, investments in health R&D represents a small (less than 1 percent) proportion of investments in R&D. This calls for enhanced advocacy to raise the overall quantum of government investment in R&D and increased prioritization of investment in health R&D.

[25]United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics website. R&D Spending by Country page. http://uis.unesco.org/apps/visualisations/research-and-development-spending/

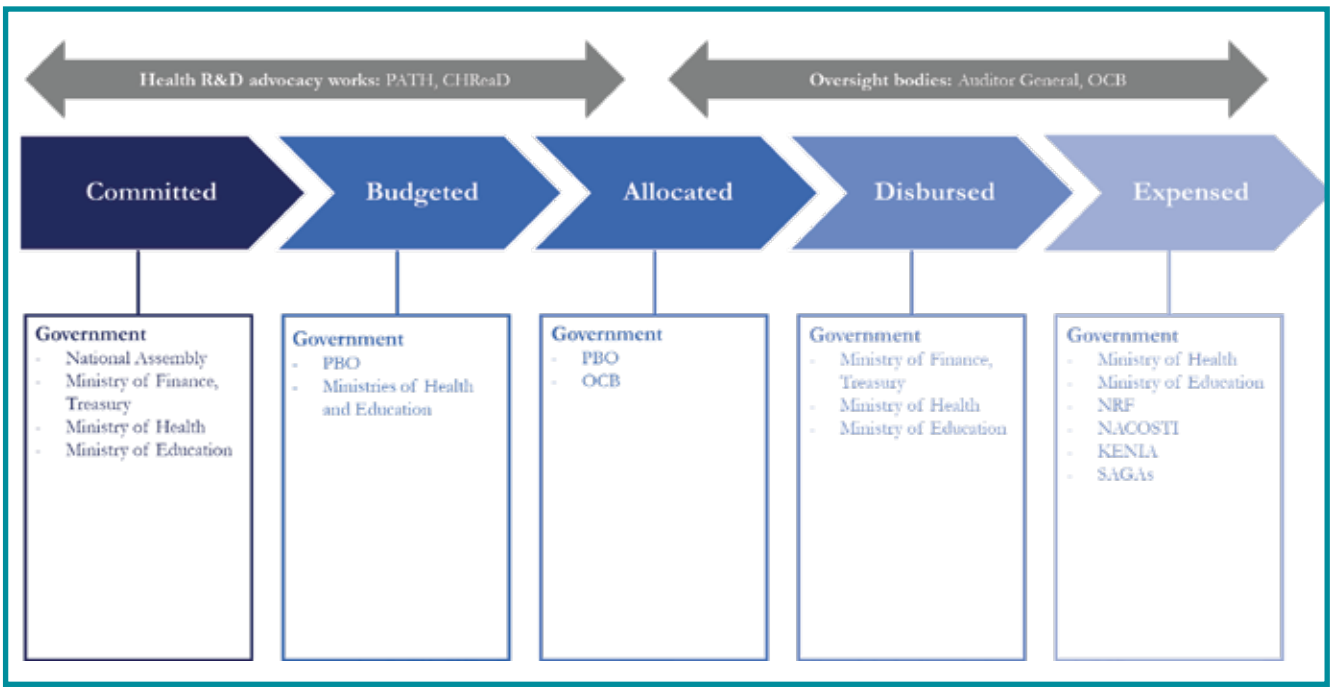
5.4. Mapping of stakeholders in the health research and development space in Kenya

Although MOH and MOE collectively have 34 SAGAs between them, only 4—KEMRI, KNH, KMTC, and NRF—have a close mandate to facilitate health R&D in Kenya. This report will therefore give an account of the contribution of these SAGAs to health R&D in Kenya.

Process flow in investing in health research and development

A five-step process is followed before expenditures in health R&D are incurred, demonstrated below in Figure 10.

Figure 10: Stakeholder mapping



a) Commitment of health R&D funds

The Government of Kenya has expressed strong commitment to enhance R&D in Kenya as evidenced by the multiple commitments it has signed on to (Table 4). Despite this, actual allocations towards R&D have performed below the targets that the Government has committed to. For instance, in 2007, Kenya signed on to the African Union Pledge committing 1 percent of its GDP to R&D. It has since then only attained between 0.5 and 0.8 percent in actual allocations. This policy commitment function is executed by the legislative arm of government, the National Assembly. In addition, relevant ministries and advocacy bodies would be engaged at this stage. This may extend to the ministries of Health, Education, and Finance.

b) Budgeting process

As shown in Figure 3, MOE and MOH go through the standard budget making process, which starts with formulation. This first stage requires the ministries to define their medium-term plans alongside their planned expenditures. The formulation stage entails iterations with the Ministry of Finance to ensure that the Government's focus areas are prioritized and adequate resources are allocated, before presentation to the National Assembly for approval and appropriations. With the core mandate to facilitate R&D in Kenya, MOH and MOE take responsibility over their respective R&D budgets. These budgets will be supplemented by allocations of other government bodies such as NRF, which are established to facilitate R&D.

Table 4: Summary of general and health R&D commitments versus actual performance in Kenya

Commitment	Target	Actual performance
ST& I Act of 2013 (for general R&D)	2 percent of GDP**Error! Bookmark not defined.**	0.8 percent of GDP**Error! Bookmark not defined.**
Health Act of 2017 (for health R&D)	30 percent of funds allocated to NRF**Error! Bookmark not defined.**	25 percent of funds allocated to NRF*

Based on the policy commitments presented in Table 4, Kenya's target for health R&D allocations relative to GDP is 0.6 percent; i.e. 30 percent of 2 percent of GDP. However, between 2017 and 2019, its average performance was 0.1 percent[26].

c) Allocation of funds to MDAs and SAGAs

Once the National Assembly approves the relevant budgets, the health R&D funds are by extension approved and awaiting allocation. The allocation of funds is overseen by the Office of the Controller of Budget (OCB) whose core mandate is to monitor the implementation of budgets and use of public funds.

d) Disbursement of funds to MDAs, SAGAs, and NRF

Following allocation and an appropriation bill, the health R&D funds may be disbursed to the intended recipients. It is the mandate of the OCB to ensure authorization of funds from the national exchequer account and into the intended recipient to facilitate health R&D. These recipients may include MOH, MOE, NRF, and KEMRI.

> "The Controller shall not approve any withdrawal from a public fund unless satisfied that the withdrawal is authorized by law."
> ***–Constitution of Kenya***

e) Expenditure of funds

Upon receipt of funds, ministries further deploy them to the intended recipients to facilitate health R&D. In addition, SAGAs and universities may receive direct inflows from the national exchequer account. For SAGAs in the health sector, much of the health R&D budget is allocated to KEMRI whose core mandate is to facilitate health research in Kenya. In the education sector, it is expected that 1 to 2 percent of the capitation funds received from government will be allocated to R&D. However, studies show that this is yet to be achieved[27]. Funding received by NRF undergoes competitive bidding before allocation and further disbursements to research institutions. Beyond the five-step process outlined above, health R&D investments in Kenya are influenced by other stakeholders including organizations that engage in policy advocacy such as various NGOs and civil society organizations (CSOs) that conduct research, advocate, and/or lobby for enhanced prioritization of health R&D by the Government. For instance, the Council on Health Research for Development (COHRED) has conducted health R&D landscape analysis to support further advocacy work that hopes to increase investment and create favorable regulations around health R&D in Kenya

[26]E&K analysis
[27]CPS Research International. The State of Research Funding in Kenyan Universities. 2018. https://www.mku.ac.ke/~mkuacke/images/pdfdocments/CPS%20state%20of%20the%20university%20research%20funding%202018.pdf

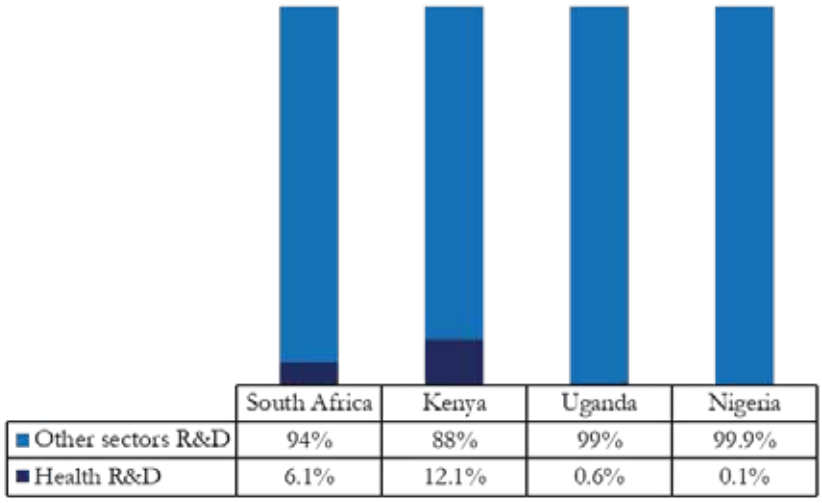
With disproportionately high burden of disease in Africa, the continent's current investments in health R&D are insufficient to meet its growing health needs

Africa is home to 15 percent of the world's population yet accounts for 25 percent of the global disease burden and only 2 percent of the world research output[28]. The region is burdened by noncommunicable diseases, communicable diseases, and emerging and re-emerging diseases (such as COVID-19 and Ebola). With the urgent need to improve health outcomes for the population, the health sectors need to leverage investments and support capacities for health science research across Africa[29].

Despite significant GERD investments, the African region makes low investments in health R&D

Gross Domestic Expenditure on Research and Development (GERD) as a proportion of GDP provides an indication of the level of financial resources devoted to R&D relative to a country's economic performance[30]. While GERD relative to GDP in Kenya and other African countries falls below the 1 percent threshold that African governments committed to, it is worth noting that the proportion of GERD that is allocated to health R&D is small (Figure 11). This further suggests that health R&D does not enjoy significant prioritization by African governments.

Figure 11: Cross-country comparison of health research and development expenditure as a proportion of general expenditure in R&D



	South Africa	Kenya	Uganda	Nigeria
Other sectors R&D	94%	88%	99%	99.9%
Health R&D	6.1%	12.1%	0.6%	0.1%

Source: Varied; E&K analysis.

[28]Schemm Y. Africa doubles research output, moves toward knowledge-based economy: What factors are driving the increase in scientific research being conducted by African scientists? Research Trends. 2013;35:1–4.
[29]Simpkin V, Namubiru-Mwaura E, Clarke L, et al. Investing in health R&D: Where we are, what limits us, and how to make progress in Africa. BMJ Glob Health. 2019;4:e001047. doi:10.1136/ bmjgh-2018-001047. https://gh.bmj.com/content/bmjgh/4/2/e001047.full.pdf.
[30]United Nations. Gross domestic expenditure on research and development as a percent of gross domestic product.". 2007;318-321. https://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/econ_development/resesarch_development_expenditure.pdf.

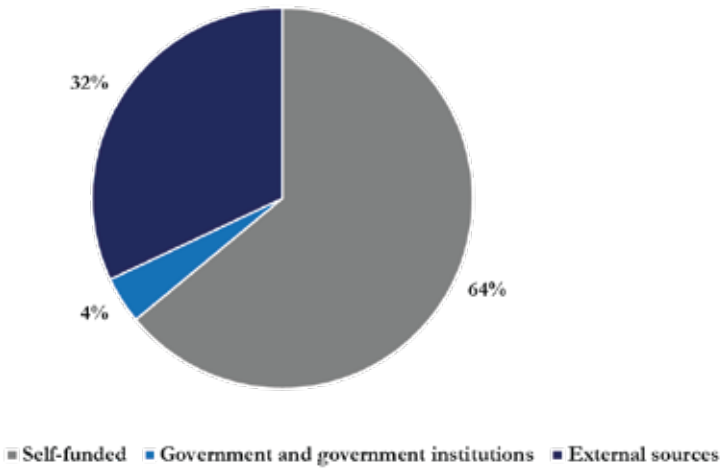
There is need to develop incentives to increase the public sector interest in health R&D

External funding is the main source of R&D funding for Kenya and Uganda. Nigeria and South Africa, however, receive their R&D funding mainly from their government[31]. The level of investments by the government is not only below the aspirational goals, but also declining for some regions. Health R&D was shown to be a neglected sector especially for Uganda and Nigeria, who allocated less than 0.5 percent proportion of their R&D budget into health. Governments face the challenge of demonstrating impact within an election cycle and as such, would opt for more concrete initiatives over abstract long-term initiatives such as R&D. There is therefore a need to develop an argument for public health research that goes beyond the economic and social arguments, which are known but not well received by the government. This enhanced argument would ideally (1) make public health visible, (2) account for the complexities of policymaking networks, and (3) adapt knowledge translation efforts to the appropriate policy instruments[32].

Primary data from NACOSTI showed a heavy reliance on self-funding sources and donor funding; only a small proportion of the health research works in period under review were funded by the Government of Kenya

During the study period, more than 700 research licenses were issued in the area of health sciences to university students, as well as to individuals from other organizations. While Government of Kenya and other government institutions such as the NRF funded a few of the research projects, more than 60 percent of them were self-funded and approximately 30 percent were funded by external grants (Figure 12).

Figure 12: Sources of financing for research in health sciences in Kenya between 2017 and 2019



Source: National Commission for Science, Technology and Innovation (NACOSTI); E&K analysis.

[31]Simpkin V, Namubiru-Mwaura E, Clarke L, Mossialos E. Investing in health R&D: where we are, what limits us, and how to make progress in Africa. BMJ Glob Health. 2019;4:e001047. doi:10.1136/bmjgh-2018-001047.
[32]Hoffman SJ, Creatore MI, Klassen A, Lay AM, Fafard P. Building the political case for investing in public health and public health research. Can J Public Health. 2019;110(3):270-274. doi:10.17269/s41997-019-00214-3.
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With pertinent issues addressed, a positive future awaits the R&D space in Kenya and Africa at large

Traditional incentives for investment in product development often rely on having an environment with a well-established infrastructure. Therefore the insufficiency of local funding and training opportunities in the region have resulted in the emigration of skilled researchers in search of better research and working conditions. Studies show that while 10 percent of degree graduates emigrate from SSA, absolute numbers for the health workforce are expected to be higher. Despite this, the number of researchers have increased over time. The SSA region is home to 1.1 percent of the world researchers, out of which, South Africa leads with over 400 researchers per one million inhabitants, leading to increased research output from the region.

Research collaborations are driven by funding availability, which often is biased towards research outside the African region. Collaboration destinations have been identified to be the United States, the United Kingdom, and France, which are also the largest funders of research in biosciences in Africa. Cross-sectoral collaborations have not been common in the region despite its benefits of knowledge transfer and alternative funding channels. The health sector has in this front witnessed an academic-corporate collaboration which often happens with pharmaceuticals. The majority of its collaborations would be with the government, which is also often the largest funder for R&D. Despite the value from the international collaborations, local researchers are exposed to challenges arising from matters around the leadership and ownership of the research work. However, alliances across African health innovation research institutions were established to encourage intra-African, South–South and North–South networking and collaboration.

Kenya's research and development for health is underfunded, despite having policies in place and governing bodies in charge of providing oversight. The committed amounts vis-à-vis what the country is spending are at worrying levels, with a huge funding gap of over 80 percent. There are a couple of reasons that are contributory to the under investment but the main issue is the lack of an investment case for health, which leads to the Government of Kenya having health research low in its policy priorities. Given the importance of health research in enhancing preparedness for health challenges, including occurrence of pandemics or epidemics, there is need for the government to increase its funding towards health R&D.

Reasons behind the underinvestment in Kenya's health research and development

The enabling environment for health R&D in Kenya is constrained by a number of factors which if acted on will significantly increase the country's interest in investing in R&D. Some of the challenges that impede health R&D progress in Kenya identified from consultations include the following:

- **Delayed formation of the National Health Research Committee (NHRC) to advocate for increased quantum of health R&D.** Without a functional health research committee, the country has no other institution mandated to spearhead efforts towards increasing the quantum of investments that go into health R&D towards the recommended thresholds. While SAGAs and other institutions may place requests for health R&D funding, differences between

[33]Simpkin V, et al. BMJ Glob Health. 2019;4:e001047. doi:10.1136/bmjgh-2018-001047.
[34]Ibid.
[35]Ibid.
[36]African Network for Drugs and Diagnostics Innovation, 2015. Pan-African Centres of Excellence in Health Innovation. Ethiopia: UNOPS. Available: http://www.andi-africa.org/ANDI_File/ANDI_COEs/ANDI_pan_African_Centres_of_Excellence_2015_edition.pdf; Nwaka S, Ochem A, Besson D, et al. Analysis of pan-African centres of excellence in health innovation highlights opportunities and challenges for local innovation and financing in the continent. BMC Int Health Hum Rights. 2012;12.

requirements and actual allocations would still be significant. There is merit in operationalizing the NHRC, which will oversee the financing landscape and ensure the government allocates 30 percent of the total research funds to health R&D, as is stipulated in the Health Act.

- **The absence of imminent results.** With no mechanism to trace the impact of the investments in health R&D, the government lacks an incentive to increase the quantum of investments. Outputs from health R&D are not adequately documented and without this evidence to back up the investment case, very little can be done. To increase quantity and consequently determine the quality of health R&D, it is vital to present an investment case backed with empirical evidence to convince the government that investing in health R&D would contribute significantly to the health outcomes.

- **Delays in disbursement of funds.** Timely proposals are submitted to National Research Fund (NRF) when calls are placed but researchers wait a long time before funds are disbursed from the exchequer account. Further, when funds are eventually disbursed, they are just a 'drop in the ocean' in terms of quantity. Delays in disbursements lead researchers towards finding alternative funding sources, which in turn gives external funders the opportunity to dictate research priorities to suit their needs.

- **External determinants of research priorities.** Project funders often determine the health area to be addressed. For Kenya's health R&D, which is dominated by external funders, a majority of the research activities are geared towards meeting the needs of the external funder and not the national health areas that need prioritization. As a result, neglected diseases dominating Kenya's health landscape remain 'neglected' because health research priorities are shifted from country-specific needs to donor needs.

"Researchers have little or no say on the health R&D work they execute since health R&D funders dictate the products received in the market and, despite existence of neglected diseases, donors are interested in profitable funding priorities."

–Professor at a Kenyan university

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7. RECOMMENDATIONS

Based on the evidence gathered from key stakeholders and the analysis presented in this report, investments in health R&D in Kenya are below aspirational thresholds and global averages. Therefore, there is need to enhance investments in health R&D in the country. In this regard, this report recommends the following:

i. **Constitute the National Health Research Committee to spearhead health R&D advocacy.** The NHRC team will ensure that the country implements the Research for Health Policy and priorities and will support development of a compelling investment case for health R&D to serve as an advocacy tool to motivate increased GoK investments.

ii. **Develop a data repository for health R&D data.** One of the challenges encountered during the study was accounting for GoK funding. This is because the research institutions did not have a means of tracking the research grants from GoK and subsequently linking the funds to specific research outputs. NACOSTI, for instance, has the mandate of overseeing all R&D activities within the country. However, while sourcing data from them, it was evident that while the data on GoK's health R&D was available, it was in a manner that was not easily retrievable, and traceable to final research outputs. There is merit in developing and hosting a data warehousing mechanism (e.g. a repository) within the health R&D space. Such a mechanism may link the funding to the research outputs and produce information that could be leveraged upon when developing an investment case for health R&D funding in Kenya.

iii. **Ensure funding is dispersed on time.** When researchers face delays from NRF in disbursing funds, they move toward finding alternative funding sources—which in turn gives external funders the opportunity to dictate research priorities. NRF must strengthen its institutional capacity to efficiently review proposals, disburse funds, and follow up on research outcomes.

iv. **Enhance in-country human resource for health R&D.** The number of researchers relative to the general population in Kenya compares poorly to other countries such as South Africa, USA and Sweden. There is merit in GoK exploring mechanism to build and retain human resources for health R&D in Kenya. In order to increase the research output that will build on the evidence required to back up the investment case for health R&D, human capital is fundamental.

v. **Enhance collaborations with other researchers.** As highlighted in the analysis presented in this report, there has been an increase in co-authorship of R&D publications by African researchers including those from Kenya. This evidences a growing interest in collaborative research among the local researchers – an interest that can be harnessed to enhance collaborative and synergistic health R&D work. There is merit in GoK exploring mechanisms to enhance collaborations such as establishing regulation that facilitate multi-county research and boost cross-sectoral and inter-regional collaborations.

vi. **Engage the private sector in prioritization of health research needs.** The private sector plays a key role in health systems including direct provision of health services, medicines and medical products, financial products, training for the health workforce and other support services. Consequently, many countries have mixed health systems where both public and private providers deliver health-related services. While the focus has been on the delivery of key health services, these partnerships can go over and beyond into health R&D and collaborations and partnerships with the private sector would increase the health R&D activity in the country.

v. **Increase the demand for health R&D.** For there to be an investment case for R&D, there needs to be a demand for it from policy makers and relevant stakeholders who see the need for research and therefore call for increased research to answer their questions. For instance, in the context of the COVID-19 pandemic, there is a need for vaccine development in the country. This has in turn challenged medical researchers including those from KEMRI to work tirelessly to try and come up with a solution. As evidenced by this, an increase in demand will result in increased research activity which will require financial support. Further, national research priorities will be more dominant if the research is targeted at the concerns raised in the healthcare space.

vi. **Develop an investment case for increased investment in health R&D.** The relatively low level of investments in health R&D by GoK points to the need to develop a compelling investment case that will serve as an advocacy tool to motivate and justify increased investments in health R&D by the government. Considering that a significant portion of the return on investments in health R&D are likely to be long term (i.e. beyond the five-year election cycles), there is merit that the investment case for health R&D takes into account this long-term horizon and be pitched to change policy and legislation so as to withstand political changes that come with the five-year election cycle in the country.

"There is a need to demonstrate the benefits of investing in health R&D in order to advocate for increased investments"

-Researcher in public university, Kenya

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vii. **Enhance both medical and policy research and include research for neglected diseases.** In order to increase the investments going into health R&D, there is need to advance policy research and medical research beyond only the curative aspects which is majorly the focus of health R&D. Focus needs to shift towards neglected diseases which, despite being commercially unattractive, bear a significant disease burden in Kenya. Institutionalization of NHRC needs to be hastened to allow the committee to steer the national research agenda to Kenya's pain points.

"Most of the research funded is curative and a bit of the money goes into preventive research. Neglected diseases have not received much attention in research yet they continue to impose a heavy burden on the country."

-Stakeholder in budget process, Kenya

Health Research and Development Investment in Kenya