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Mapping the evolution of priorities for health systems evidence synthesis in Uganda from 2013 to 2023

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Abstract

RATIONALE

Resources for conducting health systems research are often limited and yet millions of research articles, systematic reviews, technical reports, and policy briefs are published annually with a significant proportion hardly read, let alone used for decision making. We aimed to identify health systems research priorities for researched evidence synthesis; assess the availability, evolution and alignment of the evidence with these dynamic health systems priorities; and contextualized our findings in Uganda's settings.

APPROACH

Our team conducted a multiple methods study between 2013 and 2023, consisting of a mini–Delphi technique to identify health systems research priorities, an uncontrolled before–and–after assessment of availability of researched evidence to support the identified priorities in an open access database, "Pretty-Darn-Quick Evidence". We then did a qualitative documentary analysis of evolving health policies and systems in Uganda. We triangulated these findings in a higher-level synthesis captured in our report.

MAIN FINDINGS

We report financial arrangements as the most sustained priority area for health systems evidence synthesis in Uganda. Secondly, we found an abundance of existing evidence syntheses from the PDQ-Evidence database, in all the WHO health systems building blocks including health systems governance and human capital development. Third, we highlight the emergence of human capital development as a priority policy concern that received massive investment by Uganda's Ministry of Health, and at the same time recorded the highest increase in researched evidence over the decade under study. Not least, we e also identified that organizational realignment of Uganda's Ministry of Health responded to the evolving health systems priorities in line with agenda 2030 of the sustainable development goals (SDG).

CONCLUSIONS

Our study identified health financing, governance and human capital as the most resilient priorities for health systems research in Uganda. Secondly, the abundance of researched evidence in an open-access database base aligned to these health systems priorities, raises concerns about access by decision makers in bridging the "know–do–gap". Perhaps, health systems researchers in Uganda should consider constantly engaging decision makers about where and how to find relevant researched evidence and further refine their information needs before commissioning totally new studies. A key starting point would be empowering the Uganda National Health Research Organization to provide an integrated knowledge translation platform that invites decision makers to the table.

BACKGROUND

Resources for conducting health systems research are often limited (Bredan 2020; Knottnerus and Tugwell 2017) Indeed, millions of research articles, systematic reviews, technical reports, and policy briefs are published annually yet a considerable proportion are hardly read, let alone used for decision making (Doemeland and Trevino 2014; Greenhalgh 2012). This implies wastage of important resources in generating information that is either off the mark or simply inaccessible, which consequently gathers dust in shelves and libraries (Chalmers and Glasziou 2009; 2016). Thus, efficiency gains are realized by identifying priority health systems problems that can be addressed through new research, be it primary studies or secondary syntheses (Wolfenden et al. 2015; Chalmers and Glasziou 2009; 2016).

Stakeholder involvement in priority setting may enhance the relevance and use of research in decision–making (Esmail, Moore, and Rein 2015; Lavis et al. 2010; Oliver et al. 2014), particularly in low resource settings such as sub–Saharan Africa. Systematic review findings report that engaging stakeholders establishes credibility, ensures transparency and accountability, and improves the relevance and quality of the research process as well as buy–in from the informed publics and policy actors (Cottrell et al. 2014). Patients, economists who prepare social sector budgets, public health leaders at the ministry of health, or even Parliamentarians who allocate resources for social services, are examples of stakeholders in the health sector. Engaging stakeholders also helps to anticipate and manage controversy.

Noteworthy, Uganda's Ministry of Health has undergone restructuring to better position itself to handle emerging public health challenges. This evolution is likely informed by changing disease patterns in sub-Saharan Africa, such as the rising epidemic of non-communicable diseases, frequent disease outbreaks including Ebola and the COVID-19 pandemic, as well as the shrinking donor basket in the post-COVID world (Nyakarahuka et al. 2017).

We aimed to identify health systems research priorities for evidence synthesis. Secondly, we sought to assess the availability, evolution and alignment of this evidence with priorities over a decade, between 2013 and 2023. Thirdly, we aimed to contextualize our findings in Uganda's dynamic health policies and systems taking into consideration relevance to stakeholders.

METHODS

Ethical considerations.

Our study received ethical and regulatory approval from the School of Medicine Research and Ethics Committee of Makerere University College of Health Sciences, the Uganda National Council for Science and Technology (SS3271) and Office of the President, Republic of Uganda (ADM/154/212/01), whose guidelines are in line with the Declaration of Helsinki of the World Medical Association (Wen, 2025). This included informed consent, and the opportunity to withdraw at any point of the study.

Study setting in Uganda's health system.

Uganda is a landlocked country in East Africa, with a population of 45 million in 2023 up from 35 million in 2013 and its GDP increased from approximately $ 800 to $1,000 United States Dollars in the same period (Uganda Bureau of Statistics 2022; The World Bank 2023). Uganda's health system is decentralized, characterized by health regions around regional referral hospitals, within which are district hospitals, and the basic complete unit being a health center level 4 at constituency level with a medical doctor, other medical staff, an operation theater and blood transfusion services (Kamwesiga 2011; Murindwa et al. 2006).

Medical services begin at health center levels 2 at the parish administrative unit and up to health center level 3 at the sub–county administrative unit. Community health workers constitute the village health teams and perform public health duties such as distribution of mosquito nets or mass immunization campaigns (Ministry of Health Uganda 2018). The district health officer heads the district health team and reports to the chief administrative officer in the district for general duties or the director general health services at the ministry of health headquarters, in case of technical matters such as disease outbreaks (Republic of Uganda 2023).

Study population, sampling, and sample size

We purposively selected 54 individuals through identification and stakeholder mapping, with the aim of achieving diversity of views and engagement. Our map targeted the following stakeholders: Government techno–professionals, decision takers, and policy makers at the ministry of health; health service providers including health management organizations in public and private health sectors, from rural and urban areas; civil society constituting health consumer bodies and representatives of health professional associations; employer groups; development partners and health systems researchers. We also included invited participants of the first Africa Centre training on systematic reviews that was conducted by the Norwegian Satellite of Cochrane Effective Practice and Organization of Care (EPOC).

Design and description of the priority setting process

This was a multiple methods study between 2013 and 2023, consisting of a mini–Delphi technique (Pan et al. 1996) to identify health systems research priorities, an uncontrolled before–and–after assessment (Sedgwick 2014) of availability of research evidence to support the identified priorities, and a qualitative documentary analysis (Shaw, Elston, and Abbott 2004).

There were three priority setting exercises over this decade under review, for which this was the first and covered all the health systems building blocks. In August 2013, we conducted the baseline cross–sectional study during a stakeholder dialogue using a mini–Delphi approach at Makerere University, Kampala, Uganda. We employed the Supporting Use of Research Evidence guide (SURE) for prioritizing topics for policy briefs (http://global.evipnet.org/SURE-Guides/) (World Health Organization 2022). We presented participants with three background documents including priority topics for low– and middle–income countries written by the Norwegian Satellite of the Cochrane Effective Practice and Organization of Care (EPOC), https://epoc.cochrane.org/; and examples of research priority areas from the World Health Organization health systems pillars and the Millennium Development Goals 4 (child health), 5 (maternal health) and 6 (infectious and non-communicable diseases)(UNDP Africa and African Union 2014); and the Malawi National Health Research Agenda, (Ministry of Health Malawi 2012).

The Principal of the College, Prof. Nelson Sewankambo, (NKS) delivered the keynote address highlighting the goals of the 'Africa Centre', which started its operations in March 2013. One of the researchers (HN) facilitated the participants to complete two group iterations using the mini–Delphi survey technique. We followed this by email reminders for further suggestions over two weeks, before analysis in 2013. In 2023, we complemented this survey with a retrospective documentary analysis, over the past 10-year period from 2013. Briefly, we reviewed policy related strategic documents for Uganda's health sector to assess the evolution and sustainability of these priorities in 2023.

Data collection, document analysis and data synthesis

First, we categorized the stakeholders into smaller groups in a brainstorming exercise. We then arranged for each group to present their findings before ranking them. Secondly, we requested the participants to make judgments and rank the policy concerns in need of research after assessing the following aspects: importance of the problem; availability of viable interventions; opportunity for change; important uncertainty about the health-systems issue; availability of relevant research and interest in deliberation on the problem. The ranking followed a three-point Likert item: no/low = 1, uncertain/medium = 2, and yes/high = 3.We conducted descriptive analysis of the frequencies after each round of ranking, giving equal weight to each assessment criteria. We computed the total score for each policy concern by which we ranked them, prior to the next round. Finally, using the mean scores, we listed the top 10 ranked priority problems for health system research syntheses and their clusters, aligning these to the WHO building blocks for health systems strengthening, that is leadership and governance, financing, human capital, health services delivery, access to medical products, vaccines and technologies and information use.

As the initial assessment was done 10 years previously in 2013, in the documentary analysis, we reviewed policy related strategic documents for Uganda's health sector to assess the sustainability of these priorities over the five-year planning cycles until 2023. These were the Health Sector Development Plan 2015/2016–2019/2020 (Ministry of Health Uganda 2015b) and the Health Sector Strategic Plan 2020/2021–2024/2025 (Ministry of Health Uganda 2019). We analyzed selected Annual Health Sector Performance Reports for 2014/2015 (Ministry of Health Uganda 2015a) as the baseline, then 2019/2020 and 2022/2023 (Ministry of Health Uganda 2020; 2023b) for the end–line and mid–way the prevailing strategic planning periods respectively. We employed content analysis to synthesize key priorities in these documents, (Hsieh and Shannon 2005).

After the synthesis of the priority clusters, we conducted a feasibility scan of the PDQ–Evidence database (https://www.pdq-evidence.org/) (Johansen et al. 2018) to assess the extent of already existing research evidence about the proposed priority topics. We repeated this feasibility scan in PDQ–Evidence database in 2023, to assess the evolution of the availability of research evidence that would address Uganda's health sector priorities since 2013. Importantly, PDQ-Evidence is open access and was developed to suit decision makers especially in low- and middle-income countries. The contents of PDQ-Evidence are indexed in a ready for use mode for decision making, such as categorizing the papers by type. Thus, we searched for systematic reviews, scoping reviews, policy briefs or such related evidence briefs for policy in PDQ–Evidence database using Boolean logic, (Elston 2020). The specific search terms were: "health financing" OR "health insurance" OR "pay for performance" OR "performance–based funding" OR "results–based financing" OR "cost sharing", for financial arrangements; "human resources" for human resources for health; "governance" OR "public-private partnership" OR "guidelines" OR "accreditation" OR "standards"; "community engagement" OR "community participation" OR "community involvement" OR "equity" OR "contracting" for governance arrangements. We also captured the primary studies to reflect the availability or scarcity of researched evidence to support health systems priorities of low– and middle–income countries where Uganda lies. The last search was conducted on 26th July 2023, although no new records were updated in PDQ-Evidence since mid 2022.

RESULTS

Participants of the stakeholder's dialogue.

There were 45 participants who responded and participated in the stakeholder dialogue of 2013, out of the 54 who were invited, giving a high response rate of 83% (Table 1). Among the participants 14 were women (31%). Participants were from 25 different organizations including government ministries, departments, and agencies (MDAs), (n = 4), non–governmental entities (n = 6), health consumer groups (n = 1) and research institutes (n = 12). Majority (64%) of the participants were researchers from the 12 institutes predominantly Ugandan (53%). Other researchers from Tanzania, Kenya, Cameroon, and Botswana were invited to the dialogue, and took part in the mini-Delphi survey, as part of our inaugural pre–course workshop on evidence synthesis. This was the launch of the Africa Centre for Systematic Reviews and Knowledge Translation in August 2013; whose mission was to build capacity for evidence synthesis across sub–Saharan Africa.

Table 1
Participants and their home organizations in the priority setting dialogue.

Stakeholder Groups, (n = 4)	**Home institutions, (n = 25)**	**Total Participants (n = 45)**
1. Government departments (n = 4)	Ministry of Health; National Medical Stores; National Drug Authority; Medicines and Health Services Delivery Monitoring Unit	8
2. Consumer representative organizations (n = 1)	Uganda National Health Consumers Organization	1
3. Non–Governmental Organizations (n = 6)	Children's AIDS Fund Uganda; Program for Appropriate Technology in Health; Uganda Protestant Medical Bureau; AIDS Information Centre; Management Sciences for Health; Uganda Catholic Medical Bureau;	7
4. Research institutions (n = 12)	*In Uganda (n = 7)*: Uganda National Academy of Sciences; Gulu University Department of Community Health; Makerere University School of Public Health; International Health Sciences University; Regional Centre for Quality of HealthCare; Mbarara University of Science and Technology Department of Public Health; Infectious Diseases Institute, Makerere University School of Medicine. *Other African Countries (n = 5)*: Centre for the Development of Best Practices in Health, University of Yaoundé 1 Cameroon; Kenya Medical Research Institute, Kisumu, Kenya; Kenya Medical Research Institute, Kilifi, Kenya; University of Botswana, Gaborone; Ifakara Health Institute, Tanzania.	29

Priorities identified by the stakeholders in 2013.

The stakeholders in 2013 identified 36 priority areas for health systems research evidence synthesis in the brainstorming session. These included shortage of or inadequate health financing models leading to catastrophic health expenditure; shortage of and poor remuneration for human resources for health; inefficient forecasting, procurement and stock outs of essential medicines and medical supplies; sub-optimal service delivery particularly in maternal and child health including not meeting immunization targets, as well as drug resistant Tuberculosis (Table 2). Further, stakeholders identified the role of politicians and the community in fostering health priorities and better health seeking behaviors.

Table 2
Full list of health system questions identified in the priority setting exercise

Health System Topic	Is the problem important?	Viable interventions available?	Opportunity for change?	Important uncertainty about the Issue?	Relevant research available?	Interest in deliberation?	Mean Score
Delivery arrangements							
1. What are the best strategies for health worker retention in low-income countries?	12	12	10	10	10	9	10.5
2. What are the strategies for community engagement in implementation of health programs?	11	11	10	7	7	11	9.5
3. What is the impact of autonomy of health units in a decentralized system?	12	5	5	7	4	5	6.3
4. What is the most appropriate procurement system in health systems using experiences from HIV, Malaria & TB programs?	8	7	7	6	5	6	6.5
5. What task-shifting modalities are possible using experiences from surgical services?	4	5	5	4	4	4	4.3
Financing arrangements							
6. What is the most relevant health care financing strategy in low-income countries?	12	12	11	9	10	11	10.8
7. What are the alternative health financing mechanisms for financial sustainability?	11	11	11	11	11	10	10.8
8. What are the effective resource allocation mechanisms to achieve health equity & positive outcomes?	11	10	11	8	10	11	10.2
9. What are the determinants of human resources for health (HRH) effectiveness and retention?	12	11	12	10	10	11	11.0
10. What is the feasibility and health system impact of the national health insurance scheme?	12	12	11	11	11	8	10.8
11. What is the cost of treating different conditions in different regions in Uganda? Why are there disparities in cost of care? Why and how is financing a barrier to healthcare access?	12	12	12	11	9	8	10.7
12. What is the optimal combination of financing mechanisms?	11	11	11	11	10	10	10.7
13. How cost effective is a national health insurance scheme?	10	9	9	9	9	8	9.0
14. What is the quality & effectiveness of strategies for delivering health services in the context of limited resources?	10	9	9	7	9	10	9.0
15. What impact has not following the 'Abuja Declaration' caused on health services?	10	9	9	9	8	7	8.7
Organizational arrangements							
16. Inadequate TB work force specialized and integrated into TB management services e.g., Laboratory	9	11	9	10	9	10	9.7
17. Redistribution and disposal of drugs (Drug supply chain management from National Medical Stores to the facilities): Expiry of drugs, there is no framework upon which districts redistribute drugs. The feedback loop is not working.	12	10	11	11	4	7	9.2
18. Immunization: why have we never reached full coverage, yet services are	11	10	9	9	9	9	9.5

Health System Topic	Is the problem important?	Viable interventions available?	Opportunity for change?	Important uncertainty about the Issue?	Relevant research available?	Interest in deliberation?	Mean Score
Delivery arrangements							
available?							
19. What is the role of politicians in the health system?	10	9	10	11	8	8	9.3
20. Inadequate financing of MDR-TB drugs at all levels	11	10	10	10	3	8	8.7
21. Procurement of MDR-TB drugs by the health care facilities	9	9	9	9	7	7	8.3
22. Multi drug resistance Tuberculosis	9	8	8	8	7	7	7.8
23. What are effective models of public-private-partnership in the health care services?	8	9	8	7	7	8	7.8
24. Maternal health: Why is delivery under skilled care still low & low family planning use?	12	7	8	7	6	6	7.7
25. Lack of an integrated electronic management system of TB	8	10	10	10	5	2	7.5
26. What is the role of community empowerment and participation in health service delivery?	7	7	7	7	6	7	6.8
27. How can we assess the quality of laboratory services in a health system?	7	6	7	6	6	7	6.5
28. Explore and evaluate appropriate strategies for information, education, and communication to influence behavior change across diseases?	7	7	6	6	6	4	6.0
29. How can we assess supply chain management for health systems?	8	6	5	6	6	5	6.0
30. What are the strategies for harmonization of Health Management Information Systems (HMIS) and other data systems?	8	5	6	5	5	6	5.8
31. How can we scale up community involvement in their own health?	11	6	5	5	3	4	5.7
32. What is the impact of political utterances on utilization of health services and patient outcomes?	7	4	6	6	4	3	5.0
33. What is the cause of stock outs of medical supplies and where is the problem in the system?	6	6	5	5	4	4	5.0
34. How effective are our advocacy strategies for introducing new medical products into our health systems?	5	5	5	4	4	4	4.5
35. What is the impact of cost-effective utilization on health services?	8	3	3	4	3	1	3.7
36. Health service delivery	4	2	2	2	2	2	2.3

In the second level of synthesis in the mini-Delphi, the most priority health system problems were about three clusters: delivery arrangements (18, 53%); followed by financial (9, 26%) and organizational (6, 18%) arrangements. Importantly, financial arrangements dominated the top 10 priority questions (8, 80%), which highlighted health financing (health insurance), human capital (remuneration) and resource allocation (budgeting) as the resilient health systems issues (Table 3).

Table 3
Top ten priority health system cluster issues raised by stakeholders in 2013

Health System Cluster (Topic)	Is the problem important?	Viable interventions available?	Opportunity for change?	Important uncertainty about the Issue?	Relevant research available?	Interest in deliberation?	Mean Score (sd)
Health care financing							**10.8**
(a) What is the most relevant health care financing strategy in LICs?	12	12	11	9	10	11	10.8
(b) What are the alternative health financing mechanisms for financial sustainability?	11	11	11	11	11	10	10.8
(c) What is the feasibility and health system impact of the national health insurance scheme?	12	12	11	11	11	8	10.8
(d) What is the optimal combination of financing mechanisms?	11	11	11	11	10	10	10.7
(e) What is the cost of treating different conditions in different regions in Uganda? Why are there disparities in the cost of care? Why and how is financing a barrier to healthcare access?	12	12	12	11	9	8	10.7
Governance & resource allocation (Budgeting)							**10.6**
(a) What are the effective strategies for community engagement in implementation of health programs?	11	11	11	11	11	10	10.8
(b) What are the effective resource allocation mechanisms to achieve health equity & positive outcomes?	11	10	11	8	10	11	10.2
Human capital investment (Human resources for health)							**10.4**
(a) What are the determinants for human resources for health (HRH) effectiveness and retention?	12	11	12	10	10	11	11.0
(b) What are the best strategies for health worker retention in LICs?	12	12	10	10	10	9	10.5
(c) Inadequacy of the health workforce specialized in TB control and how can they be integrated into TB management services e.g., provision of laboratory services?	9	11	9	10	9	10	9.7
Mean score (sd) for the assessment categories	**11.3**	**11.3**	**10.9**	**10.2**	**10.1**	**9.8**	**10.6**

Priorities in Uganda's strategic health policy documents from 2013 to 2023.

Over the past decade, there were three health sector planning cycles in Uganda. First was the 2011 to 2015 period, from 2015 to 2020 and currently 2020 to 2025. This period reflects the transition from the Millennium Development Goals (MDG) to Sustainable Development Goals (SDG) in 2015 of which the midpoint is 2023 (World Health Organization 2015).

Our stakeholder engagement to identify health systems priorities was done in the eve of the MDG to SDG transition, during Uganda's third health sector strategic and investment plan from the financial year 2010/2011 to 2014/2015. The themes that emerged viewed health as an investment for socio-economic transformation. This planning period was aligned to the WHO health systems building blocks, with a drive towards equity, quality, safety and financial efficiency in accessing primary healthcare. ep. As this plan was informed by the MDGs of 2000, it had a disease priority model especially around AIDS, TB, Malaria and emerging epidemic of non-communicable diseases.

Secondly, the post–2015 agenda health sector development plan for financial years 2015/2016 until 2019/2020, was driven by the universal health coverage (UHC) mantra. As such health was viewed through the lens of financial risk protection of households, and indeed it was in this planning cycle that the legalization of Uganda's National Health Insurance Scheme picked momentum.

Third, while the current health sector strategic plan for financial year 2020/2021 until 2024/2025 retained the 2030 target of UHC, it recognized the pandemic potential of disease outbreaks. Thus, this plan was heavily geared towards disease surveillance, epidemic control and disaster preparedness and response; as would the post-COVID-19 era.

Evolution of priorities in Uganda's strategic policy related documents and reports from the MDG into the SDG era from 2015 to 2023

“Internationalization of priorities” was evident in Uganda's health systems strategic documents. A documentary synthesis of the strategic plans, aide memoires that spell out the annual re–prioritization list and annual health sector performance reports over this decade, underscored the unfinished business of the MDGs that were carried forward in Uganda’s strategic documents for the health sector in the post–2015 agenda of SDGs. Uganda’s unfinished MDG business entailed improving the effectiveness of social service delivery (Ministry of Finance Uganda 2010), especially maternal and child health, as well as chronic care for HIV/AIDS. Importantly, even when the global targets of halting and reversing the incidence of malaria and TB, and universal access to antiretroviral therapy were met by Uganda, they were sustained in the priority list as going concerns in subsequent strategic documents (UNDP Africa and African Union 2014).

“Affordable health care” was a quest of Uganda's government, especially during electoral campaigns. The SDG era ushered in the global movement towards Universal Health Coverage, particularly considering national financial risk protection mechanisms (World Health Organization, 2015). Despite this high–level prioritization, Uganda’s desire to establish a national health insurance scheme evolved from the Bill of 2012 (Orem and Zikusooka 2010), which was modified into the Bill and Act of 2019 and passed by the 10th parliament of Uganda in the 2021 electoral cycle, (The Indepedent 2023). However, this national health insurance scheme Act of 2019 was subsequently not assented to by the Uganda’s President due to limited consensus among stakeholders, especially manufacturers' lobby and diminished financial inclusion of 68% of Uganda’s rural population (*Personal communication with State House, Republic of Uganda*).

Further, apart from the COVID–19 pandemic, there was an exponential increase in outbreaks of Ebola, yellow fever, rift valley fever, anthrax and Crimean Congo hemorrhagic fever in Uganda between 2013 and 2023 (Nyakarahuka et al. 2023; Mirembe et al. 2021; Aceng et al. 2021; Omodo et al. 2023; United States Government 2023; Kirabo 2022). Still, domestic financing for public health responses for these recurrent disease outbreaks in Uganda continued to be a donor affair, (Kirabo 2022; United States Government 2023). Thus, the desire to import a mixed health financing model remained an unrealized priority in Uganda’s development agenda.

Notwithstanding Uganda’s health financing challenges, the country realized increased investment in human capital, medical technologies, and infrastructure as resilient priorities in the post–2015 SDG period. Specifically, in human capital development the government invested in training and hiring more medical workers and increased their salaries. For example, while medical schools increased from 4 to 14 over this decade (Ministry of Education 2023; Wikipedia 2023), medical doctors employed by government hospitals increased from 536 to over 1,500. Further, salaries of medical doctors increased from one million Uganda shillings (~$US400) to five million Uganda shillings (~$US1,500) per month (Ministry of Public Service Uganda 2020; 2018). This investment in human capital was in tandem with the Government’s increased investment in physical infrastructure for specialized medical care, with major renovations and expansion of national and regional referral hospitals as well as construction of new major facilities over this decade, 2013–2023. For example, in the Kampala capital city metropolitan area alone, five new specialized national referral hospitals were constructed focusing on maternal and child health including infertility at the new Women’s hospitals at Mulago and another at Kawempe, adult health focusing on non-communicable diseases including renal dialysis at Kiruddu hospital, and accident and emergency at Naguru hospital, (Ministry of Health Uganda 2022c; 2023c). At the same time, the Uganda Cancer Institute was elevated into the East African Centre of Excellence in Oncology and intensive care units were expanded in the regional and national referral hospitals from 55 beds to 143 beds, (Ministry of Health Uganda 2023d; Kwizera, Dünser, and Nakibuuka 2012). The latter was driven by the COVID–19 outbreak that necessitated establishing of medical oxygen facilities to 7 from 2 to support high dependency units and intensive care units, (Ministry of Health Uganda 2022a; 2023a).

The five–year strategic planning cycle coincided with the five–year electoral cycle signifying the importance of political regime transition in priority setting by making campaign promises to strengthen social services (Museveni 2016). For instance, promises uttered by presidential, parliamentary, and other local government political candidates highlighted the resilient priorities. Specifically, these were the promises to diversify health system financing through a national health insurance scheme that was never realized, salaries for medical workers were raised substantially, the national medical warehouse and blood transfusion services received increased budgets, as were several completed hospital infrastructures following these campaign promises during the post–2015 agenda.

Ministry of Health organizational reforms re–aligned to new priorities

Remarkably, in the post–2015 agenda, the Ministry of Health proposed organizational restructuring to align itself to fulfil Uganda’s evolving objectives under four directorates: curative services, public health, health governance and regulation, strategy policy and development, with 19 departments (see Table 6). Initially there were 2 (two) directorates, 5 (five) departments, and 14 divisions. These were functionalized through the various Technical Working Groups reconstituted and reduced from 14 to 11 during this period.

Table 6
Institutional evolution of Ministry of Health Uganda between 2013 to 2023

Period	Directorates	Departments	Technical Working Groups
< 2015	**n = 2** ▯ Clinical & Community Services ▯ Planning & Development	**n = 6** ▯ Clinical & Curative Services ▯ Community Health ▯ National Disease Control ▯ Nursing ▯ Quality Assurance ▯ Planning & Development	**n = 14** ▯ Health Sector Budget ▯ Human Resources for Health ▯ Health Infrastructure ▯ Medicines Procurement & Management ▯ Supervision Monitoring Evaluation and Research ▯ Private Public Partnership for Health ▯ Hospitals and Lower Level Health Facilities ▯ Maternal & Child Health ▯ Nutrition ▯ Communicable Disease Control ▯ Non-Communicable Disease Control ▯ Environmental Health and Health Promotion and Education ▯ e-Health ▯ Policy, Legal and Regulatory
> 2015	**n = 4** **New directorates, n = 3** ▯ Curative Services ▯ Health Governance & Regulation ▯ Public Health **Pre-existing directorates, n = 1** ▯ Policy Planning & Development	**n = 14** **New departments, n = 8** ▯ Diagnostic & Laboratory Services ▯ Emergency Medical Services ▯ Finance & Administration ▯ Health Infrastructure ▯ Human Resources ▯ Integrated Epidemiology, Surveillance, & Public Health Emergencies ▯ Non-Communicable Diseases ▯ Reproductive Health **Pre-existing departments, n = 6** ▯ Clinical & Curative Services ▯ Community Health ▯ National Disease Control ▯ Nursing ▯ Quality Assurance ▯ Planning & Development	**n = 11** ▯ Clinical Services and Infrastructure (CSI) ▯ Community Health (CH) ▯ Communicable and Non-Communicable Disease Control (CNCD) ▯ Governance, Standards, Policy and Regulation (GOSPOR) ▯ Health Information Innovations and Research (HIIRE) ▯ Human Resources for Health (HRH) ▯ Medicines Management and Procurement (MMP) ▯ Monitoring and Evaluation (M&E) ▯ Nutrition ▯ Private-Public Partnerships for Health (PPPH) ▯ Strategic Planning, Financing, and Development (SPAFID) ▯ Reproductive, Maternal, Neonatal, Child and Adolescent Health (RMNCAH)

Source: Health Policy & Advisory Committee, Ministry of Health, Uganda

The reforms at Ministry of Health headquarters were followed by realigning the hospital staffing structure at all levels, national, regional and district referrals, and health centers. This elevated previous divisions into departments, such as Nursing, while new ones were created such as the institutional capacity building and human resource development, emergency medical services, integrated epidemiology and surveillance, laboratory and diagnostic services, with new openings for medical professional jobs at management level. Indeed, it is during this post–2015 agenda period that health center level 2 was abolished and transitioned to level 3, to enhance Universal Health Coverage. This coincided with the Parish Development Model (PDM) (Ministry of Local Government 2022; Kyambadde 2021) by the National Resistance Movement (NRM) to bring social services closer to the people, complete with medical doctors at health center level 3, down from health center level 4.

Availability and evolution of evidence aligned to the identified health systems priorities between 2013 and 2023.

A crucial aspect in this study was to assess whether researched evidence was available to support health systems' priority interventions, in line with the priorities identified. We also assessed whether the interventions were aligned to the research evidence or vice versa, and the limitations of the availability of

the research evidence. We performed the feasibility scan of the researched evidence in PDQ–Evidence database (https://www.pdq-evidence.org/) in 2013 and again in 2023.

The literature of any type was most abundant for healthcare financing with 1,226 articles including 196 systematic reviews and 23 broad syntheses, Table 4. This was followed by literature on governance that had a cumulative 1,070 articles with 155 systematic reviews and 32 broad syntheses. Community engagement literature predominated the available evidence for health systems governance, with 556 articles of which 89 were systematic reviews and 18 were broad syntheses. Human resources for health, returned 744 articles including 152 systematic reviews and 40 broad syntheses.

Table 4
Availability, types and ten-year evolution of evidence syntheses to address the top ten priority health systems issues identified by stakeholders in Uganda, 2013 to 2023 in PDQ–Evidence database*

Health System Cluster (Topic)	Systematic reviews	Broad Syntheses/Policy briefs	Structured summaries	Primary studies	Total (%age change)
Health care financing					
National, community & private health insurance, pay for performance, cost-sharing	196 (130)	23 (15)	5 (3)	1,226 (355)	1,450 (503, 27%)
Human capital/resource investment					
Attraction & retention, performance monitoring, skills mix	152 (129)	40 (33)	3 (0)	549 (246)	744 (408, 55%)
Governance & resource allocation/distribution (budgeting)					
Governance	27 (19)	6 (6)	2 (0)	200 (60)	235 (85, 36%)
Community engagement	89 (70)	18 (18)	2 (1)	447 (190)	556 (279, 50%)
Equity in resource allocation	31 (27)	8 (6)	0 (0)	107 (45)	146 (78, 53%)
Contracting out	8 (5)	0 (0)	2 (0)	123 (17)	133 (22, 16%)
All governance literature	155 (121)	32 (30)	6 (1)	877 (312)	1,070 (464, 43%)
**Searches in PDQ–Evidence as at 25.07.2023*					

In terms of evolution of the available evidence on health systems interventions over the past decade (2013–2023), the highest proportional increase was about human resources for health (55%) including 129 systematic reviews and 33 broad syntheses. This was followed by literature on governance (43%) complete with 121 systematic reviews and 30 broad syntheses, driven by equity considerations in resource allocation (53%). While health financing returned the highest frequency of new literature in the past decade with 503 new articles including 130 systematic reviews and 15 broad syntheses, this proportion was the least at 35%.

In this period, the Africa Centre for Systematic Reviews and Knowledge Translation was involved in the evidence supply-demand ecosystem in Uganda's health sector, which informed our findings too (Table 5). These included policy briefs about the national health insurance scheme law, performance–based funding, contracting out and community engagement amongst others.

Table 5
Policy related syntheses from the Africa Center

Health System Cluster (Topic)	Policy briefs	Rapid response briefs	Policy dialogue reports	Total
Health care financing				
National, community & private health insurance, pay for performance, cost-sharing	01	06	03	09
Human capital/resource investment				
Attraction & retention, performance monitoring, skills mix	00	03	01	20
Governance & resource allocation/distribution (budgeting)				
Governance, community engagement, equity in resource allocation, contracting out	00	08	00	08
Source: Uganda Clearing House for Health Policy & Systems Research. https://uch.cengkuru.com/home				

DISCUSSION

Principal findings.

Our study sought to identify priority concerns for health systems research, and we found financial arrangements as a resilient priority area for health systems evidence synthesis in Uganda. Secondly, we sought to understand whether researched evidence was actually available to answer these priorities. Indeed, we found an abundance of existing evidence syntheses from the PDQ-Evidence database, in all the health systems priority areas including governance and human capital development. Third, we documented the emergence of human capital development as a priority policy concern that received massive investment by the Ministry of Health, and indeed highest increase in researched evidence.

Findings in relation to existing evidence.

Our study found health systems research priorities similar to an earlier study by the Uganda National Health Research Organization 15 years before (REACH-PI 2010). The respondents in this UNHRO perceived lack of funding, drugs and health personnel in government hospitals as the key health systems challenges. In the same breadth, work by Ssengooba & colleagues a decade later in 2021, identified health workforce, governance and service delivery as the top three priorities for universal health coverage (UHC) research in Uganda (62). The big question is why have these health systems research priorities remained relevant, as depicted in our study of Uganda and indeed other agenda setting exercises in sub–Saharan Africa (Amare et al. 2024), despite massive investments in the health sector by both domestic and donor money?(Mwaura J. 2024; Summers 2017; Fan 2013) Is it time for Africa to recalibrate its priority health systems interventions, especially at implementation level? There is a notion that existing interventions have the potential to provide many of the tools required to address poor health outcomes in LMIC, and the knowledge gap is in implementation research rather than in discovery of new technologies. Evidence on follow up strategies for research priorities in low–and middle–income countries may be morE informative as documented in a systematic review by McGregor and colleagues (63).

We recognize that availability of researched evidence may be necessary but not sufficient to address priority health systems challenges in low-income countries. Despite being the most researched area by far, financing health systems remains an indomitable challenge in Uganda and similar low–income countries. Could this be a prominent reflection of the “know–do–gap”? (Hulme 2014; Bennett and Jessani 2011). Given the chronic suboptimal health financing climate in sub–Saharan Africa (Eze et al. 2022), the need for innovative approaches to strengthen health systems governance based on synthesized evidence is even more urgent, (Nabyonga-Orem et al. 2023). Community involvement dominated literature on health systems governance, with substantial growth in the available evidence base in the past decade. Whether this literature informs community engagement strategies on health remains understudied.

Noteworthy, the dynamic democratic evolution in sub–Saharan Africa provides for an increasingly central role of stronger health systems governance (Osaghae 1999; Fallon 2008), that may bolster the other WHO health systems blocks with leadership, strategic policy frameworks, oversight, and accountability for which Uganda is beneficiary. Certainly, this has come with a growing demand from the informed citizenry for governments to demonstrate results from invested resources in public health, commonly packaged as promises during Uganda’s electoral cycles (Moat and Abelson 2011). Uganda’s community engagement strategy in policy formulation is prominent, through stakeholder meetings, with a proliferation of new policy documents diminished by the attendant challenge of limited policy action. Similarly, community participation in resource allocation is presumed to occur through its directly elected Parliament, where the people’s voice is represented. Within Uganda’s ministry of health, the people’s voice is heard through the health policy advisory committee (HPAC) and the various technical working groups, for which Uganda’s ministry of health underwent restructuring, (Ministry of Health Uganda 2013; 2022b).

Health systems can only function with health workers, (Reid et al. 2020); improving health service coverage and realizing the right to the enjoyment of the highest attainable standard of health is dependent on their availability, accessibility, acceptability and quality. We documented human capital development as a resilient cornerstone priority that potentially would unlock far–reaching health systems reforms, if addressed holistically. Interestingly, human resources for health had the greatest increase in available research syntheses over the decade of our study period, suggesting increased availability of evidence informed solutions. This priority problem is in tandem with the estimated global shortfall of at least 10 million health workers by 2030 in line with SDGs (Boniol et al. 2022), mostly in low–and lower–middle income countries for various reasons including: sustained under–investment in production of health workers, a mismatched skills mix, skewed within country rural–urban distribution, increasing ‘brain – drain’ to higher income countries, and the high–demand–unemployment conundrum co-existing with major unmet health needs. In the decade of our review, Uganda’s government circumvented these challenges by implementing evidence informed investments for human capital development through expanded medical schools from 3 to 10 (Wikipedia 2023), specialized medical skilling abroad, increased medical workers salaries, and restructured staffing norms at the ministry of health headquarters and health facility level, that provided new employment openings. Nevertheless, a perennial challenge is the absorption of the new medical grandaunts in the public sector or through controlled emigration for mutual benefit, right from medical internship placements (Ogei and Lewis 2023), for which new researched evidence may be informative.

Implications for future research and next steps.

The above observations pause new questions about the paradox of so much evidence available with so little done (Shulock 1999). First, why did key actors in Uganda’s health system, despite the abundance of synthesized evidence, recurrently prioritize human capital development or financing for further research? Was the availability of evidence necessary and sufficient to cause policy action in the Ugandan context? Or could it be that evidence required active feet beyond peer reviewed articles, policy briefs and dialogues? Were Ugandan researchers providing the relevant synthesis products to decision takers, through push or integrated efforts? To what extent were Ugandan researchers creating demand for pull efforts from decision makers?

Perhaps these questions suggest that the ministry of health, development partners and health systems leaders in local governments could introduce an evidence checklist in its policy approval process, to enforce the use of researched evidence especially systematic reviews and evidence and gap maps (Lavis

et al. 2006). This will generate tailored demand by imploring policy formulators to find and apply researched evidence in the choice of interventions or dis-investment in ongoing policies.

Strengths and limitations of identifying health systems research priorities in low-income countries including Uganda.

There were several strengths and important shortcomings of our study. First, this is the first synthesis of resilient health systems research priorities in a low–income country, over a decade. Secondly this study triangulates both methods and data from various sources, including a documentary analysis with validation from an open access health systems database, PDQ–Evidence. Third, this study maps the evolution of evidence and contextualizes its findings in Uganda's evolving health systems over a decade transcending the post–2015 agenda of SDGs and UHC. There were also limitations namely empirical evidence from stakeholder views that were not captured; and the weak attribution of increased availability of researched evidence as identified in the PDQ-database, informing health sector reforms in Uganda's health systems.

Conclusions

Our study highlighted that health systems financing was the most sustained topic that needed researched evidence for synthesis. In addition to human capital and governance, these findings suggest that access to evidence by decision makers remains an important challenge in bridging the "know–do–gap", given the abundance of evidence accessible in the open access PDQ-Evidence database. Also, this evidence evolved with Uganda's Ministry of Health restructuring to reflect the shift from MDGs to SDGs, in an "internationalization of health systems priorities". This calls for health systems researchers in Uganda to constantly engage decision makers about where and how to find relevant research evidence and further refine their information needs. A key starting point in Uganda, would be empowering the Uganda National Health Research Organization to provide an integrated knowledge translation platform for the health sector.

Declarations

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Author contributions

Conception: EAO, HN, NKS | Data capture: EAO, HN, NKS, RA | Data synthesis: EAO, HN, NKS | Drafting manuscript: EAO, HN, NKS, RA | Accepting manuscript: EAO, NKS, RA

Ethical approval, Consent to Participate & Publish declarations

Our study received ethical and regulatory approval from the School of Medicine Research and Ethics Committee of Makerere University College of Health Sciences, the Uganda National Council for Science and Technology (SS3271) and Office of the President, Republic of Uganda (ADM/154/212/01), whose guidelines are in line with the Declaration of Helsinki of the World Medical Association (Wen, 2025). This included informed consent, and the opportunity to withdraw at any point of the study. This is not applicable to the data obtained from publicly available resources such as proceedings of the Uganda Parliament captured in the Hansard.

Data Availability declaration

No, I do not have any research data outside the submitted manuscript file. All the data available is provided in the tables in this manuscript and in the references for the documentary analysis, for example the Uganda Ministry of health Knowledge Portal: http://library.health.go.ug/

Competing Interest declaration

No, I declare that the authors have no competing interests as defined by BMC, or other interests that might be perceived to influence the results and/or discussion reported in this paper. This manuscript arises from post-doctoral work of the lead author: E.A.O

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