

Comparative Analysis of Health Research Financing as a Veritable Tool for Achieving and Sustaining Universal Health Coverage in Nigeria and South Africa

Adeneye Adeniyi Kazeem^{1,*}, Sulyman Medinat Ayobami¹, Adeneye Adejuwon Adewale²,
Olayemi Olalekan Moses¹, Salami Kabiru Kunle³

¹Health Policy and Systems Research Group, Nigerian Institute of Medical Research, Yaba, Lagos, Nigeria

²Department of Pharmacology, Therapeutics and Toxicology, Faculty of Basic Clinical Sciences, Lagos State University College of Medicine, Ikeja, Lagos, Nigeria

³Department of Sociology, Faculty of the Social Sciences, University of Ibadan, Ibadan, Nigeria

Email address:

oakadeneye@yahoo.co.uk (A. A. Kazeem)

*Corresponding author

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Abstract: Background: Nigeria is a signatory to the Abuja Declaration on allocation of 15% of the national budget to health and World Health Organization declarations that call on countries to allocate at least 2% of the national health expenditure to research. This review estimated the percentage share allocation of Nigeria's national budget to health and health research. Method: This is a documentary review of the national budget and research literature on healthcare financing in Nigeria and South Africa, Africa's largest economies. No date restrictions were placed on the searches except the special focus on the national treasury reports and annual institutional financial reports published between 2012 and 2018. We searched nine electronic databases (PubMed, EMBASE, Web of Science, SCOPUS, Cochrane library, Academic Search Complete, Google and Google Scholar and HINARI) and, national treasury Databases of Nigeria and South Africa with search terms that included public health financing. Results: Nigeria's total budget increased by 83% from ₦4.7 trillion (USD13.1 billion) in 2012 to ₦8.6 trillion (USD23.9 billion) with a corresponding 26% increase in health allocation and 55.4% growth in health research allocation between 2012 and 2018. In contrast, South Africa's total budget increased by 57.5% from R1.06 trillion (USD74.3 billion) in 2012 to R1.67 trillion (USD117.1 billion) with a corresponding 68.4% increase in health allocation that fluctuated between R122 billion (USD8.6 billion) and R205.4 billion (USD14.4 billion) in the same period. The percentage increase in health research allocation for South Africa was 69.3% in the same period. While South Africa with near universal health coverage (UHC) allocated an average of 11.7% and 1.2% to health and health research respectively in 2012-2018, Nigeria allocated only an average of 5.0% and 0.74% to health and health research respectively in the same period with no trajectory towards achieving the 15% and 2% targets. Conclusions: Findings underscore very poor health sector and health research funding in Nigeria and still far from meeting the targets of international declarations in contrast to SA. Realizing the pivotal role of a strong health research base, substantial increase in health and health research budget allocations to meet the 15% and 2% targets respectively are required to achieve and sustain UHC and improved health outcomes in Nigeria by 2030.

Keywords: Health Financing, Government Health Expenditure, Health Research, Universal Health Coverage, Nigeria, South Africa

1. Introduction

In the existing literature, universal health coverage (UHC) which has been described using different conceptual terminology such as universal health care [1], universal health care coverage [2, 3], universal health system, universal health coverage, or simply universal coverage, that all refer to basically the same concept [1, 4-7] has been acknowledged as a priority goal of every health system [8, 9]. Universal Health Coverage (UHC) as an operationalized concept epitomizes the ideology of ensuring everyone has access to needed key good quality health services at affordable cost without financial hardship linked to paying for care [8]. It is a major health system policy focus in sub-Saharan Africa including Nigeria [10]. In 2014, a presidential summit on UHC held in Nigeria to address initiatives and interventions required at national level at achieving equitable, qualitative and universally accessible healthcare for all Nigerians without suffering financial hardship [11].

Universal health coverage (UHC) is both a means of improving health and promoting human development. This puts research for universal coverage in the wider context of research for development. Unfortunately, the need for research as a key component of achieving UHC was not addressed at the 2014 Nigerian presidential summit on UHC. Research was expected to play a role not only in meeting the Millennium Development Goals (MDGs) but also in supporting the post-2015 development agenda [12]. For example, more research is needed to improve the resilience of health systems to environmental threats such as those posed by climate change [12].

Research needs researchers with skill and integrity, who are funded to work in well-equipped institutions [12]. Unfortunately, a study by UNESCO in 2013 showed that sub-Saharan African researchers including Nigerians accounted for about only 1.1% of the world's researchers across all disciplines [13]. In another study that surveyed global investment in research and development globally in 2018, sub-Saharan African countries that included Nigeria were reported to spend 0.4% of their gross domestic expenditure (GDP) on research and development compared to the world average of 1.7% [14]. More recently, two meta analyses showed that despite 17% of the world's population living in Africa, Africans contributed just 3% of the global share of indexed publications related to SARS-CoV-2/COVID-19 at 10 months into the pandemic [15, 16]. Previous studies suggest that Africans have been underrepresented in medical literature related to the burden of disease on their continent, with their research sector producing less than 1% of the world's health research each year [16]. This is more worrisome knowing that the continent's research potential and capacity is being under-utilised and at the same time home to 16.7% of the world's population.

Low and middle income countries, particularly in sub-Saharan Africa including Nigeria, have scarce resources and limited fiscal space to address their health system challenges [17, 18] and there is the need for high quality evidence to use

those resources efficiently. Unfortunately, health policies are not always informed by the best available evidence [19] despite the established fact that the better the knowledge base from research upon which policies are built, the more likely they are to succeed [20].

By way of definition, research, according to Asika [21] and Mbanefoh [22], is any carefully organized and scientific enquiry that aims at discovering and providing information that can then be applied in practical settings for solving identified problems. To the Office for Human Research Protection [23], research is a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalisable knowledge. Research in a detailed description is a process of systematic inquiry that entails the logical documentation of facts, analysis and interpretation of those facts in accordance with methodologies set by specific professional fields and academic disciplines [24, 25]. Research is conducted to evaluate the validity of a hypothesis or an interpretive framework; to assemble a body of substantive knowledge and findings for sharing in appropriate ways and to generate questions for future inquiries [24, 25]. Court et al [26] asserted that research has the most impact on policy when it is topically relevant to the pressing policy issue of day and is operationally useful.

Research is vital being the main spring of developing the technological change, systems and services needed to achieve UHC. It helps to make progress, not only towards UHC but also towards achieving the health-related development goals and sustaining these goals thereafter [12]. Research illuminates the path to UHC and to better health. Research for UHC addresses questions on three levels. First, what is the nature of the health problem, e.g. is it disease-related or health-system related? Second, what specific question is being asked, and where is this question placed in the cycle of research from understanding causes to applying solutions? Third, what is the most appropriate study design for addressing the question at hand? [12].

Health research according to Lucas [24] is the process for generating new knowledge using scientific method to identify and deal with health problems. Health research is used to identify and set priorities; guide and accelerate the application of knowledge to solve problems; develop new tools and fresh strategies; and advance basic understanding and knowledge. Health research drives development, as it generates the knowledge needed to improve health systems performance and, ultimately, health and health equity [27].

It has increasingly been seen as critical for poverty alleviation and for achieving development goals given that infectious diseases and poverty are closely inter-related in a vicious cycle [28]. The spectrum of health research include not only biomedical research that aims to uncover the biological basis of disease and provide treatments, but also health policy and systems research, social and behavioural sciences research and operational research [29].

Health research guides and strengthens health policy and programming as well as action of government and private

agencies, provide the basis for more effective health planning, targeting limited resources to save more lives and devising cost-effective interventions, identify and track health risks, develop new tools such as drugs, vaccines and diagnostic tests, direct and facilitate adaptation of policies and programmes to local environment, and advance knowledge to provide the spring board for future scientific advances [24]. The role of research in health services is that it enables innovation. There is no disputing the assertion that research is quite imperative in driving innovation in any sphere of life including the health sector. It is suffice to state that just as there can be no progress or development without innovation, there is no innovation without research. Research has significant role to play in addressing a wide range of questions about universal health coverage and provide answers that can guide health policy and practice [12].

It is important to emphasise that at the global level, there is a renewed interest in the role of health research in the implementation of the health strategies and primary health care approach [24]. More recently, the health research community is paying more and more attention just as there has been a significant level of international discussion about how to harness a mix of short, medium and long-term approaches for health research and ensure research knowledge are used to inform policies more effectively in order to achieve targets of global and national health-related development goals particularly in low- and middle-income countries [30-32]. Universally, due to its acclaimed significance for socio-economic development, research has commanded great attention among smart nations. That perhaps explain why, as claimed in the UNESCO Institute for Statistics report, “global spending on research and development has reached a record high of almost USD1.6 billion.” The report also added that about 10 countries contributed 80% of the above-mentioned research and development spending, just as some others have committed themselves to considerably increasing public and private research and development investment together with the number of researchers by 2030, in a drive towards attaining the Sustainable Development Goals (SDGs). This stoutly underscores the crucial role of research in attaining development through improved health care and well-being of the population [14].

In recent years, there has been a surge of interest and call for need for innovative health research in Nigeria as reflected in government policies and statements, and in numerous publications, conferences, seminars, workshops and related activities [33-40]. The outcome of a stakeholders’ workshop on priorities for biomedical research and health research policy formulation identified five categories of areas of research concerns that included communicable diseases, non-communicable diseases (NCDs), basic and strategic research, health policy and systems research and research on socio-cultural factors affecting health [34] which eventually emerged into a National Health Research Policy serving as a framework that guides health research and is expected to operate within the ambit of the National Health Policy of the

country [41].

High-quality research is essential for identifying the health needs and improving the health outcomes of a population [42]. The priority for improved basic health care and health research in the context of national goals particularly in recent times following the commitments of the new SDGs [43] and urgent need for response to address the threats of diseases such as efforts on vaccine development and production, the COVID-19 pandemic, the Ebola virus disease outbreak in 2014-15, as well as others that include avian influenza, HIV/AIDS, drug-resistant malaria, tuberculosis and Lassa fever as well as the increasing incidence of non-communicable diseases that include diabetes, heart-related diseases, kidney diseases and hypertension has now been well-established given the poor ability of the country’s weak and inefficient health system to cope with the disease burden following many years of neglect and deterioration due to poor funding.

Nigeria is a signatory to the 2001 Abuja Declaration in which African Union member states committed to allocating at least 15% of their annual national budgets to health [17, 44, 45] and is committed through the Mexico (2004), Algiers (2008) and Bamako (2008) declarations that call on countries to allocate at least 2% of the national health expenditure and invest 5% of development assistance (aid) funds in research that contributes to improving the performance of their health systems [12, 46, 47]. A more recent recommendation is that developing countries should commit 0.05% to 0.1% of GDP to government-funded health research of all kinds while higher-income countries should commit 0.15% to 0.2% of GDP to government-funded health research [48].

Unfortunately meeting the target of the 2001 Abuja Declaration aimed at increasing national allocations to health has remained a challenge given that the target had been achieved by only 6 countries that excluded Nigeria by 2012 [45]. By 2016, the situation had deteriorated with 21 African countries spending less on health as a percentage of their public spending than in the early 2000s [17]. The allocations to the health sector as a percentage of total government budget among sub-Saharan African countries ranged from 6% to 22% in 2012 [45] and accounted for only 1% of global spending on health in 2018 [49]. It is logical to consider the Abuja Declaration target together with the recommendation of the High Level Taskforce on Innovative International Financing for Health Systems (HLTF) that low income countries such as Nigeria need reach USD44 per capita total health expenditure (THE). Over one-third of the countries in the African region have not managed to raise health spending to the level of USD44. Considering the three indicators including General government health expenditure (GGHE) as a percent of gross domestic product (GDP) greater than 5%, the THE per capita greater than USD44 and the Abuja Declaration target of at least 15% of the national budget allocated to health sector in 2012, only Liberia, Rwanda and Swaziland managed to meet the three targets same year. Further in 2012 for example, Nigeria’s per capita expenditure on health showed that THE per capita was less than USD44 in 2002 but greater than

USD44 in 2007, 2012 [45] and 2018 [49, 50] with GGHE less than 15% target of Abuja Declaration [45, 50].

Between 2009 and 2018, there has been a reduction in the patterns in GGE as a percentage of GDP government revenues and spending as a share of GDP [49]. General government expenditure in Nigeria on health as percentage of GDP was 1%, 2% and 2% in 2002, 2007 and 2012 respectively [45] and 0.58% in 2018 [50]. Health spending in 2018 in lower income countries including Nigeria was only 5.5% of general government spending on average, smaller than the share of military spending [49]. Thus, achieving successful health care financing system continues to be a challenge in these countries that include Nigeria. The poor health spending perhaps contributed to Nigeria's health performance being described as one of the poorest worldwide over the years by Yunusa *et al* [51] and Wollum *et al* [52].

It is within the context of the drive to attaining and sustaining UHC being a health-related SDG target that this review draws on available and relevant literature to provide an overview and the state of public health care financing and more specifically how this impact on health research financing in Nigeria and examine the implications for achieving UHC in the country by 2030.

2. Method

This is a documentary review of the national budget, health research financing and research literature on healthcare financing and describing UHC in Nigeria and South Africa, being Africa's two largest economies. The implications of these for achieving UHC in the former country compared to the latter given that there are no primary data used in this review was also considered. There was no basis for obtaining ethical approval from Institutional Human Research Ethics Committee. A number of published research articles, commentaries, policy documents, reports on health research financing, and implications for research and development were purposively searched and reviewed. Inclusion criteria included data obtained from all published commentaries and original research articles in peer-reviewed journals and published reports while unpublished studies, commentaries, reports and review articles were excluded. Eight electronic databases (PubMed, EMBASE, Web of Science, SCOPUS, Cochrane library, Academic Search Complete, Google and Google Scholar and HINARI) were searched from November 18, 2020 to March 26, 2021, using variant Medical Subject Headings (MeSH) and free-text (Text) terms to retrieve published literature using a complete list of key words such as health research, health research financing public health financing, health expenditure and universal health coverage. We reviewed only papers published in English.

We equally searched the national treasury databases of Nigeria [Budget Office of the Federation, Federal Ministry of Finance] and South Africa [National Treasury] and reports published between 2012 and 2018 (three years pre- and post-2015 MDG deadline) were reviewed with search terms that

included national budget, health expenditure, health research, health research financing, public health financing. National health research budget in this paper is limited to the government-funded health research institutes in the budget of the Republic of South Africa's Department of Health and Nigeria's Federal Ministry of Health namely the Nigerian Institute of Medical Research (NIMR), the National Institute for Pharmaceutical Research and Development (NIPRD) and the National Arbovirus and Vector Research Institute.

There was also a desk review and web-based search conducted for relevant grey literature of published conference/sessional papers, legislative bills, government policy documents and reports of health-related agencies of the Federal Government of Nigeria and bilateral and multinational organizations from websites and the archive of NIMR Library domiciled in Library and Information Communication Technology Department. The websites accessed included WHO, World Bank, UNESCO, USAID, UNFPA and The Centers for Disease Control and Prevention (CDC). Some financial records of data on institutional budget for research through the annual financial reports for 2012 to 2018 were also obtained from the Finance and Accounts Department of NIMR and the website of the South African Medical Research Council (SAMRC). No date restrictions were placed on the searches except the special focus on the national treasury reports and annual institutional financial reports published between 2012 and 2018.

The Nigerian Institute of Medical Research (NIMR) used as a case study in Nigeria is the apex medical research institute in the country. The institute is an internationally recognized research institute supported by the Federal Ministry of Health and mandated by the National Science and Technology Act of 1977 to conduct basic, applied and operational research into diseases of public health importance, develop human and infrastructural capacities for clinical and biomedical research and strengthen structures for dissemination of research findings for the promotion of national health and development while providing enabling environment and facilities for health research and training in cooperation with ministries of health, and in collaboration with universities, allied institutions and organized private sectors nationally and internationally. Just like NIMR is to Nigeria, the South African Medical Research Council (SAMRC) is of same status to the Republic of South Africa.

Using the search engine tools, we got 3,918 hits, most of which were commentaries, research articles, letters to editors, reviews and reports. Only 118 of these hits met the criteria of published commentaries, original research articles and reports.

Additional information were obtained from the experiences of the authors with a series of one-on-one phone interactions among the authors during which the authors discussed and shared their different experiences with regards to UHC and overview of Nigeria's health care and health research financing challenges. The contributions were included in the different thematic areas of the paper. These subjective contributions by the authors however do not in any

way prejudice or undermine the validity of the paper.

3. Results

The findings of the retrieved published commentaries, original research articles in peer-reviewed journals and published reports are, thus, summarized below.

3.1. Nigeria's Disease Burden

Nigeria grapples with a high disease burden, of which the traditional communicable diseases that included lower respiratory infections, malaria, HIV/AIDS and tuberculosis are the major cause. Communicable diseases account for 66% of the total burden of morbidity in the country [35]. The WHO's Global Health Observatory showing global estimates on leading causes of deaths and disability adjusted life years (DALYs) 2019, for example, indicated that communicable diseases, maternal, perinatal and nutritional conditions remain the dominant part of the top ten leading causes of DALYs in Nigeria unlike in South Africa where it was a mix bag of both communicable diseases and non-communicable diseases (NCDs) [53]. However, NCDs including cancer, diabetes, depressive disorders, stroke, cirrhosis and ischaemic heart disease and injuries from road crashes are increasingly becoming an important contributor to the disease burden of the country particularly among adults [53, 54]. As the country makes gains in the control of HIV/AIDS and other communicable diseases, the significant burden of NCDs and injuries among adults is thus a growing concern among health policy makers given the increasing number of reported cases [55].

The disease burden shows Nigeria's malaria incidence of 291.9 cases per 1,000 population at risk, tuberculosis incidence of 219 cases per 100,000 population, new HIV infection at 0.65% and the probability of dying from the four major NCDs at 22.5% [56]. The impact of the disease burden shows that the country has a neonatal and under-five mortality rates of 36 and 120 deaths per 1,000 live births respectively, maternal mortality rate of 917 deaths per 100,000 live births [56].

3.2. UHC in the Nigerian Context

The UHC is synonymous with the global campaign slogan "Health for All by the Year 2000" based on the Alma Ata Declaration to accelerate scale-up of primary health care (PHC) services to attain better health services for all [57, 58]. It is the modern iteration of the health for all" goals.

In 2014, the presidential summit on UHC held in Nigeria, recognized that health is a fundamental human right and the provision of good health for the population is the responsibility of the government. The summit equally recognized that UHC holds the key to unlocking the door for equitable, qualitative and universally accessible healthcare for all Nigerians without suffering financial hardship. The key challenges for achieving UHC in Nigeria identified at the summit are related to the sub-optimal health system

characterized by inadequate financial protection for the poor, shortage and mal-distribution of human resources for health, uneven quality of health care services, poor supply of health commodities, weak referral system and budgetary constraints [11].

Nigeria has shown commitment to achieving UHC, but progress has been slow [59, 60]. Though there is no established policy document solely on UHC in Nigeria, the country can be described as having a policy framework for UHC with the implementation of policies and programmes undertaken with various strategies to facilitate improved access to quality and affordable health services and address the high disease burden towards achieving UHC [61]. A review by Uzochuhwu *et al* [61] showed that the Nigerian government has put in place various policies and plans addressing health care financing to facilitate achieving UHC: quality, effective efficient and affordable health services to ensure healthy lives and the well-being of Nigerians. It would be uncharitable to the country's previous administrations to imply that health was unplanned in the country until the adoption of UHC as a target of the SDGs. It has been planned to the extent that it has featured prominently in all Nigeria's development plans since independence.

The existence of policy strategies, development plans and some entrenched in legislation that include versions of the comprehensive National Health Policy to achieve health for all Nigerians preceding the UHC era [33, 62] and since the adoption of UHC by 2030 as a SDG target in 2015 [35, 63], National Health Financing Policy [64] such as the National Health Insurance Scheme Act with the enabling law decree 35 of 1999 (now Act 35 of 1999), the Nigeria Health Act 2014 which includes the Basic Health Care Provision Fund (BHC PF) for UHC [38] and the National Strategic Health Development Plans [63] suggest that the political will exist with some attention made to recognize government's aspiration to position the country to attain UHC with strategic moves to address the need for improved access and financial protection aspects of UHC in line with the commitment to SDGs. The National Strategic Health Development Plan II (2018-2022) for example is anchored in the National Health Policy 2016 focuses on 15 priority areas and aims to operationalize legal and policy frameworks for the primary health care (PHC) revitalization. Together with the government's BHC PF, the implementation of the PHC revitalization will be financed to achieve UHC.

These policy documents, at different level, address certain aspects of UHC. The National Health Policy 2016 which reflects the country's renewed commitment to UHC having been a build-up to the strategy to achieve health for all Nigerians launched in 1988 has the objective "to attain universal coverage of critical services that positively contribute to the realization of policy goals" provides a more detailed documented commitment to achievement of UHC for all Nigerians [35]. The National Health Policy 2016 is a viable framework with 10 policy thrusts that include health financing and health research and development. The implementation of which is geared towards fast-tracking the

progress towards UHC. The policy sets the background to earmark adequate public resources to health towards strengthening primary health care through the Basic Healthcare Provision Fund. Half of the fund will be managed by the National Health Insurance Scheme to ensure access to a minimum package of health services to guarantee accessible and affordable quality health care by the population. The vision for Nigeria's National Health Policy 2016 is "Universal Health Coverage (UHC) for all Nigerians" with the mission "to provide stakeholders in health with a comprehensive framework for harnessing all resources for health development towards the achievement of Universal Health Coverage as encapsulated in the National Health Act, in tandem with the SDGs" [35].

Similarly, South Africa has laid out a strategic programme to achieve UHC through what is termed "the 10-point plan" since 2009. The plan focuses on improving infrastructure, human resources for health, and procurement and guide the country in improving the country's healthcare system and increasing access to healthcare [65].

Comparatively, the context of UHC shows that the UHC index of service coverage for Nigeria in 2018 was 43% compared to a higher 69% for South Africa [56].

3.3. Tracking Progress Towards Achieving UHC in Nigeria and South Africa

Highlight of key indicators of the health financing profile to monitor the progress towards achieving UHC in Nigeria compared to South Africa are presented in Table 1. The four target indicators proposed by WHO to monitor and evaluate progress to achieving UHC are: THE should be at least 4-5% of GDP; out-of-pocket (OOP) spending should not exceed 30-40% of THE; over 90% of the population is covered by pre-payment and risk pooling schemes; and close to 100% coverage of population with social assistance and safety-net programmes [66, 67].

Nigeria's THE as percentage of GDP has fluctuated between 3.2% in 2000 and 3.9% in 2018 (less than the baseline of 4-5%) [50]. Nigeria's health expenditure is relatively low, even when compared with other African countries. The THE as percentage of the GDP from 1998 to 2000 was less than 5%, falling behind THE/GDP ratio in other developing countries such as Kenya (5.3%), Zambia (6.2%), Tanzania (6.8%), Malawi (7.2%), and South Africa (7.5%) [68].

Most health services in South Africa (about 86%) are provided through the public sector, yet only about 50% of health expenditure comes from the government [50]. Government health expenditure (GHE) as a percentage of THE in South Africa increased from 39.9% in 2006 to 48.4% in 2013 [65]. Comparatively, this is in contrast to Nigeria where 77.3% of health expenditure comes from the private sector. While GHE as a percentage of THE was 50.1% in 2018 for South Africa, it was 14.9% Nigeria is the same year. In 2019, 7.9% of THE in Nigeria was from external resources (donors) compared to 1.9% in South Africa [50].

The UHC monitoring report of 2017 showed that many people lack essential health services and people are pushed into poverty due to much spending on health care services [69]. Table 1 shows that out-of-pocket health expenditure in Nigeria is more than 60% of THE [50, 70, 71] instead of the recommended OOP share of THE upper limit range of 30-40% [66]. This is contrary to South Africa where OOP expenditures on health have decreased over the years and successfully remained below the recommended range [50, 65]. Similarly, minimal coverage with health insurance and other pre-payment mechanisms exist in Nigeria with less than 5% of the population covered by pre-payment and risk pooling schemes and less than 2% coverage of population with social assistance and safety net programmes instead of the recommended lower limit of 90% and 100% respectively.

The percentage of people with catastrophic health expenditure, as tracked by SDG indicator 3.8.2 showed that the population with household expenditures on health greater than 10% and 25% of total household expenditure or income threshold in Nigeria in 2019 was 15.5% and 4.06% respectively. This is in contrast to 1.41% and 0.12% for South Africa for the same monitoring indicators respectively [53]. Table 2 presents the percentage of population impoverished by out-of-pocket health spending at various international poverty lines.

The situational analysis of Nigeria's health system from the perspectives of the strategic thrusts of the NHSDP and the WHO health system building blocks showed that the health system is weak and underperforming across all building blocks. The analysis further showed a near total absence of financial risk protection with inequity in access to services due to variations in socio-economic status and geographic location of the population [35].

Table 1. Target indicators for monitoring progress towards UHC in Nigeria comparative with South Africa.

Characteristics	Target Indicators	Nigeria	South Africa
Population		206.1m (7 th)	59.3m (25 th)
2019 PPP Adjusted GDP current international Dollars		USD1.22 trillion	USD676 billion
Per capita		USD5,887 (131 st)	USD13,526 (92 nd)
Total Health Expenditure (THE) per capita		USD83.8	US\$26
Total Health Expenditure (THE) as % of GDP	≥4-5%	3.9%	8.3%
% of out-of-pocket (OOP) spending of THE	≤30-40%	76.6%	7.7%
% of population covered by risk pooling schemes	≥90%	5%	16%
% of population with safety net programmes	100%	4%	79%

Sources: The World Bank [50], Price Waterhouse Coopers Limited [71], Health Policy Project [72], UNFPA [73]

Table 2. Percentage of population impoverished by out-of-pocket health spending at various international poverty lines.

Various international poverty lines	Nigeria	South Africa
PPP USD 1.90 a day poverty line	>2.27–13.42	>0.16–0.92
PPP USD 3.20 a day poverty line	>2.27–13.42	>0.16–0.92
Relative poverty line of 60% of median per capita consumption	>2.27–13.42	>0.16–0.92

Source: World Health Organization and International Bank for Reconstruction and Development [74]

3.4. How Health Research Has Fared in Nigeria

The history of health research in Nigeria could be traced back to 1920. It started to develop when the Rockefeller Foundation established the Yellow Fever Commission in Lagos. The Virus Research Institute was later established in 1925 to service the Commission. In 1954, the various medical research units in different parts of Anglophone West Africa were brought together under the West African Council for Medical Research before Nigeria gained its independence in 1961.

In his response addressing the question on how health research has fared in Nigeria, Lucas [24] going down memory lane pointed out how Nigeria has produced some distinguished scientists who have produced highly commendable research results winning the respect and admiration of their peers worldwide. He emphasized that the country's medical schools in the immediate post-independence period generated research results that equally attracted the interest of scientists from all over the world. Lucas [24] attributed the successes in the excellent research outputs from Nigerian scientists than to the contributions of expatriate teachers and mentors who helped build the national academic institutions and worked with the Nigerians in setting the pathways to success of scientific knowledge and outcome. Unfortunately, the poise for steady growth and development in the early reported achievements was adversely affected by rapid expansion of universities with depleted thin national resources followed by the devastating effects of the economic recession [24, 75].

Udo-Aka [76], on the other hand, traced the history of health research in Nigeria to the development of health services in the country during the colonial era. The establishment of research field units devoted to finding solutions to health problems of the population was pointed out to have accompanied the developed health services. The next stage in history was the establishment of the West African Council for Medical Research which metamorphosed to Medical Research Council of Nigeria, the fore-runners of the now Nigerian Institute of Medical Research, followed by the emergence of universities and their faculties including medical schools where health research had to be taken in the institutions. Other institutions that have contributed to health research in the country include hospitals, independent research institutions, pharmaceutical companies, non-governmental organizations and other business firms. The country's national health policy with health research component and priorities have been developed and revised overtime outlining the strategy for strengthening the national health research institutes (the Nigerian Institute of Medical Research and the National Institute of Pharmaceutical

Research and Development) to contribute to evidence-based decision-making [34, 35, 62].

Given that improving health care delivery is a pressing societal goal, health research provides evidence-based practice in health planning, policy making and service delivery [77] that can be used to build an effective and efficient health system [78]. The pivot around which health research policies are drawn is the improvement of the health and well-being of the individual and the community, and it accords well with the Benthamian utilitarian principle of "the greatest good to the greatest number" [79].

The principal justification for and primary objective of all health research is to discover the most rapid and thrifty of solving health problems through the diagnosis, prophylaxis and therapy of the major diseases of mankind; to upgrade the health of the people through the discovery and application of improved modes of living for the steady maintenance of good health; and to discover the best techniques for translating knowledge and communicating the useful results of these investigations to the consuming public [80, 81]. These universal principles apply completely to the Nigerian situation.

Unfortunately, according to Udo-Aka [76] and Nwokolo [81], Nigerians from the people in the community to policy makers at all levels of government have not yet understood, accepted and appreciated research as essential for development and progress in all fields of endeavor of the society particularly the area of health. On the contrary, research is accepted as an essential part of existence in developed countries where the cost of engaging in research activities seem not matter knowing that the end apparently justifies the resources expended [82]. In his analysis, Lucas [24] noted that unlike developing countries including Nigeria, developed countries had successfully harnessed the "blessings" of science and technology to promote the health of their populations.

Knowing that research is a fundamental building block to improve the health systems performance through in-depth and critical examination and understanding of the country's health problems, disease profiles and level of resources required to solve the problems [78, 83], moving towards attaining and sustaining UHC will hence require strong health research base. Moreover, as a growing point of knowledge, with health needs and demand rises fast, growth in expenditure on research becomes inevitable [84].

Like all researches, health research is a capital intensive adventure. Developing countries with Nigeria inclusive apparently invest little in health research [24, 29]. For example, while the West African Council for Medical Research/Nigerian Medical research Council spent £77,555, the British Medical Research Council spent £154 million that

is about 200 times as much as what the West African Council for Medical Research/Nigerian Medical Research Council spent over the same 15-year period of 1957 to 1972 [84].

Mapping of top 40 African cities by research output highlighting hotspots and coldspots of research and development activity and highlights inequities in research and development productivity across the continent showed most spots in Nigeria being in the range of 100-249 articles per city compared to 500-999 and more than 1000 articles in South Africa [12, 85]. In 2007, the number of researchers in research and development per million people was 39 in Nigeria compared to 393 in South Africa which increased to 518 per million people in 2017 with no data for Nigeria in the same year [86].

The establishment and inauguration of the National Research and Innovation Council (NRIC) as a pinnacle of research in the country climaxed in 2014. It is envisaged to bridge the link between research and industrialization. With the determination and commitment to ensure that as a country, there is appropriate investment in Science, Technology and Innovation (STI) in order to guarantee the country's competitiveness both on the continent and at global stage. The NRIC is backed by the National Research and Innovation Council Bill yet to be signed into law by the President of the country.

3.5. The Threshold of Funding Below Which Health Research Cannot Take Place

The question "Is there a minimum level of funding below which research cannot take place?" was passively asked by the former military Head of State of Nigeria, General Ibrahim B. Babangida in his opening address at a conference on "Health research priorities for Nigeria in the 1990s and strategies for their achievement" organized by the National Institute of for Medical Research, Lagos in conjunction with the Federal Ministry of Science and Technology and the Federal Ministry of Health in February 1991 is still relevant to ask in this paper at this juncture in history.

To a large extent, the answer is yes, if a meaningful research with credible data is to be conducted either at the individual or national level. This is because research protocols need to be reviewed and approved for both the scientific merits and ethical integrity, part of which is a realistic and adequate budget plan (funding) for the complete implementation of the research is required in accordance to international codes and guidelines on health research ethics and section F (a) of Nigeria's National Code for Health Research Ethics [87].

It is perhaps in response to this question by sheer act of providence that the African Union member states committed to allocating at least 15% of their annual national budgets to health [17, 44] and the World Health Organization recommended a benchmark for countries to allocate at least 2% of the national health expenditure and invest 5% of aid funds for health in "essential national health research" [12, 46, 47, 88].

Ataguba and Akazili [89] pointed out that health care in South Africa is financed through a combination of mechanisms just as Paruk *et al* [90] reported that health

research is funded from multiple sources that include local (public and private sectors) and foreign agencies. According to Paruk *et al* [90], the South Africa's Ministry of Health, the Department of Health (DoH) and the National Health Research Committee (NHRC) have made a series of commitments to increase investment in health research through the country budget and the national health budget over time. For example, the National Health Research Policy of 2001 [91] proposed that the country budget for health research should be raised to at least 2% of total public sector health expenditure. Subsequently, the Ministry of Health committed itself through the Mexico, Bamako and Algiers declarations to allocate at least 2% of the national health budget to research [12, 46, 47, 88]. In addition, the 2011 National Health Research Summit report [92] similarly recommended that the national Department of Health increase its funding for health research to achieve the 2% target of the national health budget.

Just like South Africa, health care financing in Nigeria is largely from a combination of budgetary allocations from government at all levels (Federal, States and Local) through oil and tax revenues, out-of-pocket payments, loans, grants through donor funding, private sector contributions and health insurance (social and community) [66, 93]. Research in Nigeria, on the other hand, depends largely on the government and external support from international donor organizations (bilateral and multinational) or development partners as they are otherwise called [94].

In filling the funding gap, development partners have intervened through partnerships and collaborations for many years with huge financial and material resources in form of aids and grants strengthening research capacity in Africa with Nigeria inclusive [95]. Many of these international donors though have a disproportionate influence over research priorities and funding [96], yet have made significant contributions to capacity strengthening in African health institutions with series of health research capacity strengthening charities supporting career development of researchers and research to empower and enthuse researchers through training fellowships and mentorship programmes and strengthening and enhancing research environment with state-of-the-art technology and high quality facilities required in a vibrant and thriving local research environment [95]. For example, under the strategy for 2000-2005, the Research Capability Strengthening (RCS) area of the UNDP/World bank/WHO Special Programme for Research and Training and Tropical Diseases (TDR), approximately 40% of the TDR/RCS budget was earmarked for eligible researchers in low income/least developed countries with high disease burden that included Nigeria be for researcher-driven support. Furthermore, 30% of same budget was allocated to institutional capacity building and 10% to individual researcher capacity building from same category of countries [97].

Trend in national and health budgets in Nigeria 2012-2018.

Nigeria's total budget increased by 83.0% from ₦4.7 trillion (USD13.1 billion) in 2012 to ₦8.6 trillion (USD23.9 billion) with a corresponding 26% increase in health budget that fluctuated between ₦283 billion (USD786.1 million) and

₦356.5 (USD990.3 million) and 55.4% growth in health research allocation between 2012 and 2018. The percentage change in budgetary allocations to health (capital and recurrent expenditures) in Nigeria from 2012 to 2018 presented in Table 3 shows 9.4% increase in capital expenditures compared with 30.9% increase in recurrent expenditures. The average percentage of capital and recurrent expenditure in the national health budget are 17.5% and 82.5% respectively for the period 2012 to 2018.

In contrast to Nigeria, South Africa's total budget increased by 57.5% from R1.06 trillion (USD74.3 billion) in 2012 to R1.67 trillion (USD117.1 billion) with a corresponding 68.4% increase in health allocation that fluctuated between R122 billion (USD8.6 billion) and R205.4 billion (USD14.4 billion) in the same period. While there was a 55.4% increase in health research budgetary allocation in Nigeria from 2012 to 2018, the percentage

increase in health research allocation out of national health budget for South Africa was 69.3% in the same period.

Figure 1 illustrates the trend in national and health budgets in Nigeria between 2012 and 2018 relative to those of South Africa in the same period.

Table 3. Total federal budgetary allocation to health: recurrent versus capital (2012-2018).

Year	Total Budget	Capital Expenditure	Recurrent Expenditure
2012	283	65 (23.0%)	218 (77.0%)
2013	279	64 (22.9%)	215 (77.1%)
2014	262	46 (17.6%)	216 (82.4%)
2015	259.8	22.7 (8.7%)	237.1 (91.3%)
2016	250.1	28.7 (11.5%)	221.4 (88.5%)
2017	308.2	51.3 (16.9%)	252.9 (83.1%)
2018	356.5	71.1 (19.9%)	285.4 (80.1%)

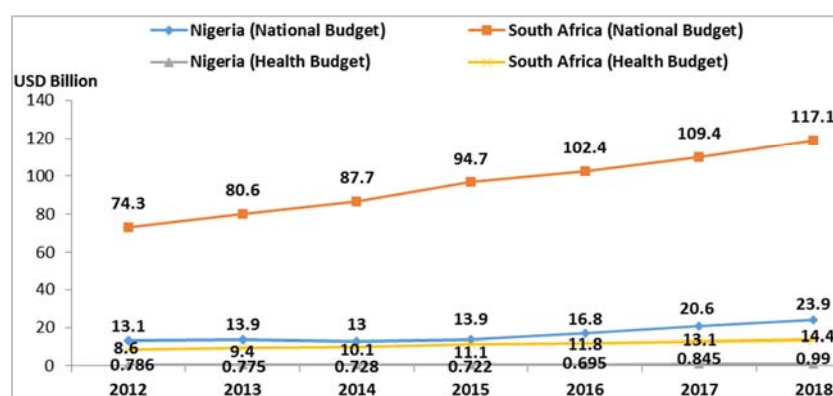


Figure 1. Trend of National and Health Budgets of Nigeria and South Africa 2012-2018.

National budgets relative to allocations and releases for the health sector in Nigeria and South Africa (2012-2018) are illustrated in Figure 2. Compared to South Africa's health allocation as a percentage of the national budget which ranged from 11.5% to 12.3% in 2012 to 2018, Nigeria's health allocation as a percentage of the national budget fluctuated between 6.0% and 4.1% in the same period.

While South Africa with near UHC evident in Table 1 allocated an average of 11.7% and 1.2% to the health sector

and health research respectively between 2012 and 2018, Nigeria allocated only an average of 5.0% and 0.74% to the health sector and health research respectively in the same period with no trajectory towards achieving the 15% and 2% targets of the African Union and WHO respectively. The national health budgets relative to allocations and releases for health research in Nigeria and South Africa (2012-2018) are illustrated in Figure 3.

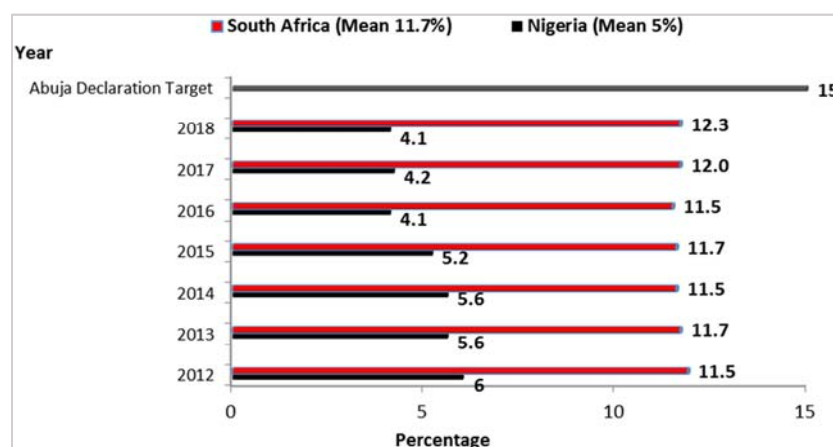


Figure 2. Percentage share of health budget in Nigeria compared to South Africa 2012-2018 relative to Abuja Declaration target.

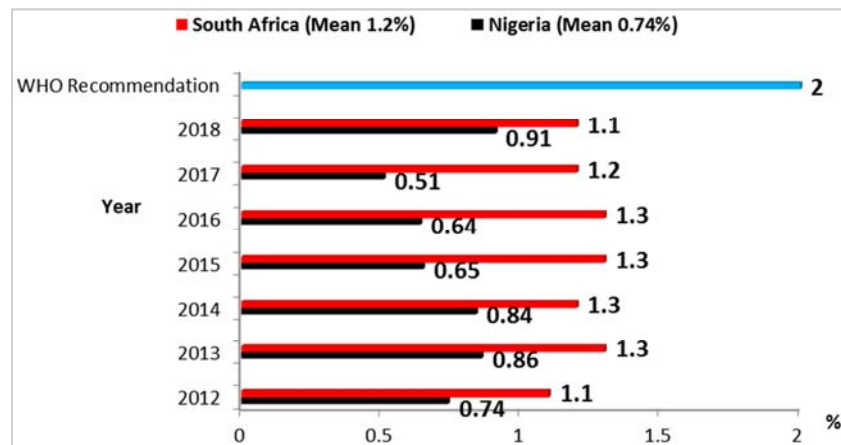


Figure 3. Percentage of national health budget allocated to research in Nigeria compared to South Africa 2012-2018 relative to WHO recommendation.

The budgetary allocations and releases for research operations of NIMR being the apex health research institution as an institutional case study of the state of health research financing in Nigeria are illustrated in Figures 4 and 5. Interestingly, Figure 5 shows the fluctuating release of total appropriated funds for NIMR that averaged at 88.4% of averaged 57.2% of budgeted fund appropriated. This is

unlike 100% release of appropriated fund for SAMRC.

From illustration in Figure 5, the appropriated funds and actual appropriated fund released for NIMR between 2012 and 2018 increased by 124.7% and 104% respectively. This is in contrast to 28.9% and 37.8% being percentage increase in appropriated funds and actual appropriated fund released for SAMRC respectively between 2015 and 2018.

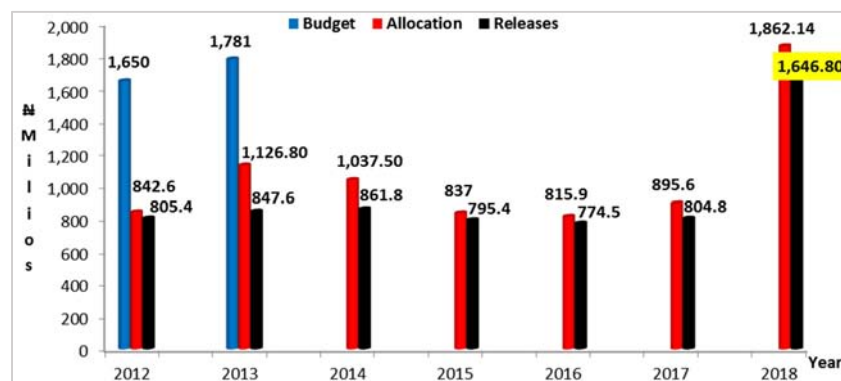


Figure 4. Trends in budget, allocations and releases to NIMR 2012-2018.

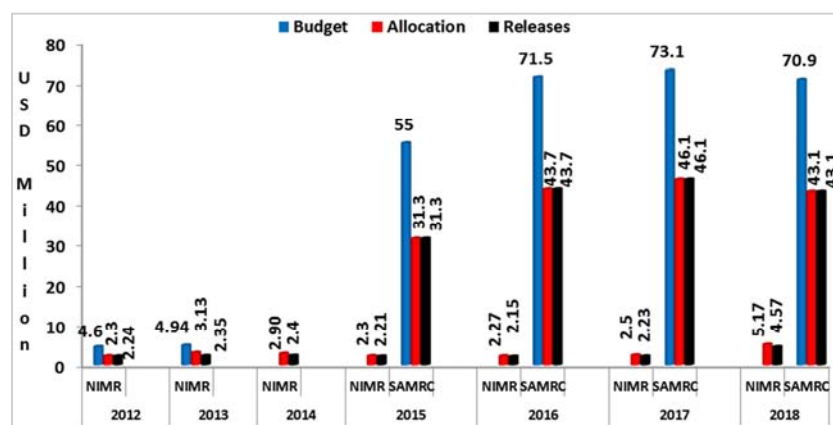


Figure 5. Trends in budget, allocations and releases to NIMR compared to SAMRC 2012-2018.

4. Discussion

The review provides information that will help reposition

perspectives on health research funding and policies on government spending on health and health research in Nigeria as envisaged in the National Health Policy [35] and National Strategic Health Development Plan II [63] so as to

enhance research as a veritable tool in improving the health of Nigerians as the countdown to achieving and sustaining UHC in 2030 and beyond begins.

It is interesting and encouraging that Nigeria just like South Africa has existing policy documents with framework serving as pathway to achieving UHC though that of Nigeria did not come out early enough like that of South Africa.

The findings of this paper as presented in Table 1 show that Nigeria's health system falls short of the target indicators for monitoring progress towards UHC. The findings connect with those in the review by Uzochukwu et al [61] of health-system financing for UHC in Nigeria that showed high out-of-pocket health expenditure, a very low budget for health at all levels of government, and poor financial risk protection. This is important considering the proportion of population pushed into poverty annually (4% Nigeria vs. <1% SA) due to high out-of-pocket health expenditure which may likely increase knowing that about 60% of the population of Nigeria lives on less than USD2 per day [98]. The vicious cycle of high out-of-pocket expenditure on healthcare indirectly negates UHC definition by WHO [8].

Thinking that policy makers particularly in government are much more likely to be engaged with research they fund and commissioned as emphasized by Hennink and Stephenson [99] and corroborated by Court et al [26], one would have expected more funding of research by past and present governments of Nigeria given the country's commitment to the Abuja Declaration and other WHO recommendations on health research funding.

The review shows that the level of government expenditures in Nigeria's health sector over the years tells a story of neglect. The findings attest to the fact that poor and inconsistent funding have been a major constraint in research implementation in Nigeria. Despite the substantial evidence from studies that public financing is key to the achievement of UHC, government expenditure on health and health research has remained very low in Nigeria and domestic resource mobilization remains weak too [100-102]. The low health and health research expenditure in Nigeria indicates government's lack of political will to prioritize funding for healthcare and health research.

A cursory review of Nigeria's budgetary allocations to the health sector and health research by extension over the years suggest that not only has it been abysmally low compared to South Africa as shown in Figure 1, these have well been below the targets set by the WHO and African Union for member States as evident in Figures 2 and 3, actual releases for health expenditures and health research are only a fraction of total budgetary allocations as evident in Figures 4 and 5. Figure 5 shows the consistent release of total appropriated funds for SAMRC than it was for NIMR.

It is important to point out that the rising trend in the total health budget could be directly derived from the corresponding upward trend of the annual national budget over same period as displaced in Figure 1 and Table 3. This is similar to the pattern reported by Federal Ministry of Health [93] that Nigeria's health expenditure grew three folds

between 2003 and 2014. The health budget for the year 2018 in Table 3 perhaps had a significant boost as a result of the increased allocation to the Federal Ministry of Health and the release of ₦55.15 billion (USD153.2 million) by the National Assembly for the implementation of the National Health Act which was passed in 2013 as observed by Adebisi et al [103]. However, the question of whether these increments in public health spending have translated into desired economic growth and prosperity of the people leaves much to be desired.

It is evident that health financing in Nigeria is from a variety of sources that include budgetary allocations from government, and grants, private sector contributions, out-of-pocket expenses and loans. In a situation where the country's total public debt (external and domestic) stood at ₦32.92 trillion (\$91.4 billion) as at December 31 2020 [104], the latent effect of such humongous loan repayment manifesting in the disparity between capital and recurrent expenditures by government particularly on health becomes burdensome when loans were taken and the bulk of such loans were used to finance recurrent expenditures and a substantial part of recurrent expenditures in the national budget in turn is used for debt servicing coupled with cases of corruption that involve diversion and misappropriation of public funds meant for various developmental projects in the health sector which could likely affect health research allocations and implementation in one way or the other. More so, it is worse with poor capital expenditure performance where only 51% of the total appropriated funds for capital expenditures were utilized in 2012 for example. In same year, only 55.3% of the 73.8% of the country's capital health expenditure released was utilized [105]. We recommend that debt should not be taken by government for the main purpose of financing recurrent expenditures as our findings clearly reveal that this keeps the vicious cycle of disparity between capital and recurrent expenditures which is inimical to adequate funding of health research that require more substantial investment from capital expenditure.

It is apparent that over the years, Nigeria's allocations for capital expenditure have suffered a setback given the continued increase in the recurrent health expenditure within the period reviewed in Table 3. The huge disparity can be directly associated with the increasing demand for increased salaries and allowances by different categories of health workers. This is more obvious in 2015 which was an election year in the country with 91.3% of the health budget being recurrent expenditure. Perhaps this could be attributed to the disproportionate severance emoluments for political office holders among others and in addition be a decoy by the government to meet the demands of the health workers as a gimmick to win their hearts and votes during the election and perpetuate itself in power. Moreover, the huge chunks of the Nigeria's government expenditure have been channeled into recurrent expenditure over the years could further be attributed to other factors such as expansion in size of the civil service and debt servicing as earlier emphasized.

The enormity of the proportion of the recurrent health expenditure and the percentage change in its increase relative

to the total health budgetary allocations to a large extent have overshadowed the fairly low increase in the capital expenditure over the period under review. The arithmetic progression of capital spending compared to the geometric progression of recurrent spending is grossly unacceptable given the rapid growth rate of the country's population and the implications of this on the country's weak health system as emphasized by the Health Reform Foundation of Nigeria [106] in its analysis of the 2012 national health budget of Nigeria. This is of concern given that Shelton [107] expectedly posited that growing population and problems including health associated with it often exacerbate the pressure for the government to increase public health expenditures which has not been forthcoming to the anticipated level in Nigeria.

The observed trend of the disparity between capital and recurrent expenditure for the years in review is lower when compared to a higher capital expenditure that ranged from ₦6.4 billion (USD17.8 million) in 2003 to ₦41.8 billion (USD116.1 million) in 2007 and represented 16.1% and 31.8% of total health budget with a mean of 29% over the five-year period (Adeneye Pers. Comm.). The percentage change in capital expenditure between 2012 and 2018 at 9.4% is far lower when compared with 553.1% and 55.5% increases in capital expenditure the country had between 2003 and 2007 (Adeneye Pers. Comm.) and 2007 to 2012 [106] respectively.

Unlike in Nigeria, South Africa's health sector was allocated 12.3% of the total budget in 2018, the health sector was one of the largest recipient of resources, trailing basic education (16.5%) and receiving almost same as social development (12.9%). When combined, the three largest social service sector votes accounted for over 40% of consolidated government expenditure that are key to achieving UHC, a ratio that has remained quite stable since 2013 [108].

Given that growth and development in any sector are achieved and sustained with capital investment as posited by HERFON [106], it is doubtful that the less than 20% proportion of the health budget being the annual average for capital expenditure within the period reviewed is sufficient to achieve meaningful growth and development in the health sector. This perhaps explains why the country to a large extent failed in meeting any of the targets of the 2015 Millennium Development Goals. It becomes imperative that for any meaningful growth and development in the health sector to be achieved, the country needs to bridge the wide gap between capital and recurrent expenditures that has remained perennial going by findings of similar previous health budget analyses for 2003 to 2012 (Adeneye Pers. Comm.; 106).

It is believed that a substantial increase in annual health budget allocations for the country with a corresponding exponential increase in capital health expenditure in subsequent years to meet the 15% and 2% targets set by the African Union's 2001 Abuja Declaration and Mexico, Bamako and Algiers Declarations by WHO respectively will facilitate investment in the procurement of state-of-the-art

equipment, reagents and other laboratory materials needed to conduct more quality basic and operational researches that will help inform health policy, practice, strengthen the health system and increase access to health care services as a pathway to achieving UHC by 2030.

The variation in the evidence suggesting track to UHC from the review could be explained by various determining factors ranging from the peculiarity of the series of fiscal policy reforms that each country (Nigeria and South Africa in this case) implemented over a period of time as noted by Onifade *et al* [109]. The variation could also be explained from the perspective of Nigeria's National Health Act that was legislated in 2014 and further reinforced with the National Health Policy in 2016. This is unlike in South Africa where the National Health Act has been in existence since 2003 and has been providing a framework for a structured and uniform health system for the country [108].

Given that the way a country finances its health care system is a key determinant of the health of its population [110], the gains made over the last few decades in finding solutions to important health problems such as measles, tetanus, polio, malnutrition, malaria and HIV/AIDS that contributed significantly to the reduction of maternal, child and infant mortality and morbidity rates will be lost and health indicators will continue to go off-track in Nigeria unless the health sector particularly the component of health research is not seriously funded to continuously and rigorously find solutions to the numerous health problems and strengthen the health system performance through adequately informed policy-making on health that need substantive evidence generated from research.

It is important to state that for the country to move in the right direction of achieving and sustaining UHC by 2030 and beyond, it becomes imperative that government raise sufficient funds for health and health research, overcome financial barriers that exclude many poor from accessing health services, and provide an equitable and efficient mix of health services as emphasized by Uzochukwu *et al* [61]. Knowing that counterpart funding from state and local governments (since health is on the concurrent list of the Constitution of the Federal Republic of Nigeria) as well as private sector partnership recognized as key to achieving UHC at the Presidential Summit on UHC in 2014 and are at the core of the National Health Act implementation, resource mobilization and accountability are key factors for successful implementation of the National Health Act [100] that will significantly contribute to achieving UHC in Nigeria.

The non-availability of budget item from year 2014 to 2018 for NIMR in Figures 4 and 5 as retrieved from the annual reports reviewed could be attributed to the change in budgetary policy by the Federal Government of Nigeria from the incremental budgeting to zero-based budgeting technique in 2016 [111, 112]. Zero-based budgeting is a budgeting process that allocates funding based on programme efficiency and necessity rather than incremental budgeting that is connected to previous year's spending or history. Here, budget is developed around what is required for the next

coming financial year or a period irrespective of the size of the budget in comparing with the previous years. It is prepared regardless of the previous years' budgets and their corresponding actual results and variances [111, 112].

Knowing that the commitment to increase funding for health and institutionalize mechanisms that will improve efficient use of funds by all levels of government as part of the key expected outcomes of the Presidential Summit on UHC in 2014, the trend of budget allocations and releases for research has rather been on the decline and ridiculously remained low in Nigeria. This trend is contrary to the level of funding of the Department of Health and the South African Medical Research Council (SAMRC) by the South African government as evident in Figure 5. Mere looking at the actual figures will do the analysis a disservice because the annual percentage of appropriated fund released is found to be on the decline from the peak in 2012 to a lower level in 2013 only to rise in 2014 and 2015 and thereafter continued the descend till 2018. This finding corroborate the report by The World Bank [50] that showed low GHE as percentage of THE in Nigeria at 14.9% in 2018 contrary to a higher GHE of 50.1% for South Africa in the same year. Interestingly, the annual percentage of appropriated fund released to NIMR by the government is found to be on the rise. This has increased from 88.4% in 2018 to 99.9% and 99.8% in 2019 and 2020 when appropriated funds and actual funds released for same years increased by 29.3% and 46.1% in 2019 and by 8.3% and 8.2% in 2020 respectively (Adeneye Pers. Comm.).

Given Shelton's [107] position on the pressure for the government to increase public health expenditures often exacerbated by growing population and problems including health associated with it and if one of the basic functions of government in any country is to provide quality and effective health care services to its citizens, the justification (s) for low health funding in Nigeria over the years is questionable. It is beyond comprehension that Nigeria despite her vast endowed natural resources, GDP and particularly a population that is three and half folds that of South Africa (see Table 1) allocates fractions of what the latter country allocates for her health sector and health research (including the level of funding of NIMR versus SAMRC) and expect being on the same pedestrian of UHC target by 2030. Adequate funding of the health sector in general and health research institutions in the country most especially NIMR therefore becomes very important if quality and effective health care services are to be made available to the people. It is important because the importance of human capital to economic growth [113-115] cannot be overemphasized because it serves as catalyst to development.

To overcome this health research funding challenge in particular, the need to inaugurate and launch the National Research and Innovation Council (NRIC) into action is long overdue after many years which the Bill establishing it as enacted by the National Assembly of the Federal Republic of Nigeria has been awaiting being signed into law by the President since 2016. The NRIC is expected to primarily perform functions that will set directions to coordinate

research and innovations, draw up and periodically review national research agenda based on national needs and priorities, develop mechanisms to raise funds for research and innovation from legitimate means such as research development tax and make grants available for research scientists to conduct meaningful research. It is also suggested that a special national endowment or intervention fund for research should be explored and established in collaboration with the private sector as stated in the National Health Research Policy [41] to source and mobilize fund to supplement government funding to ensure the sustenance of health research in the country. Such intervention fund could take similar form of the Petroleum (Special) Trust Fund and the Tertiary Education Trust Fund (TETFund) which is a product of the Tertiary Education Tax Act of 2011 that makes all Nigerian companies liable to education tax at 2% of their assessable profits [116] and have successfully helped improve the education sector to a large extent in the country.

If one of the reasons the Presidential Summit on UHC was held in Nigeria in 2014 is anything to go by, then the desire to remove barriers to achieving UHC in the country through multi-sectoral and multi-government level (Federal, State and Local) interventions require the highest level of political commitments at all level of governance since health is on the concurrent list of the country's Constitution, findings underscore the need for a substantial increase in health and health research budgetary allocations and release. A key aspect to achieving the UHC by 2030 in Nigeria is to intensify government spending on health relative to other sectors such as works, power and housing, defense, education, water resources, transportation and education that have received more funding in the budget over the years. These become critical because the health expenditure in Nigeria has ridiculously remained low when compared with those of some key ministries such as works, power and housing, transportation, education, defense and water resources earlier listed as pointed out by Price Waterhouse Coopers Limited [117]. Compared to the average of upper middle-income countries and Nigeria, South Africa's government allocated more resources to health as a share of total government expenditures [65]. Nigeria therefore needs to emulate South Africa in this regard with government at all levels exercising the political will and financial commitment towards the realization of the goals and objectives of the different policies that provide framework for the coordination of health research activities including mechanism for guaranteeing sufficient funding in the country.

The view that many developing countries including Nigeria invest little in health research that is a capital intensive adventure as argued by Lucas [24] and Global Forum for Health Research [29] is corroborated by findings from this review. Nearing midway to the UHC 2030 deadline, our review shows the urgency with which policy makers in Nigeria need to increase public health and health research funding as a veritable means of achieving and sustaining UHC in 2030 and beyond.

The main limitation of this review is its focus mainly on

government funding as the only source of health care and health research financing considered. A more holistic review of health financing from the perspective of government, private and external total health expenditure as shares of total health expenditure in Nigeria is recommended for future research in order to provide more insights into what percentages of these funds from the different sources are allocated for health research in the country. Further research into budgetary allocations for health and health research financing at all levels of government (Federal, States and Local) are needed to understand the actual status of health research financing in the country.

5. Conclusion

Findings from this review corroborate those of Adebisi et al [103] and underscore the reason (s) for the very poor state of the health sector and health research funding in Nigeria compared to what obtains in South Africa and other low and middle-income countries in terms of government health and health research budgetary allocations. The country is still far from the targets of international declarations aimed at strengthening the health system and improve health research. Realizing the pivotal role of a strong health research base, substantial increase in health and health research budget allocations to meet the 15% and 2% targets respectively are required to achieve UHC and improved health outcomes in Nigeria by 2030.

Findings from our review provide important insights on the fact that there is gross inadequate funding of health and health research by the Government of Nigeria compared to South Africa. Given the findings, Nigeria may fail to meet the UHC target and other health goals of national priority by 2030. To overcome the challenge, government recognition of health research as a veritable tool for achieving UHC in particular and development in general. The government also has to make designated health research institutions particularly NIMR used as a case study in this review and other institutions that contribute to health research in the country stronger by substantially increasing the level of funding on health and health research at every level of governance if research is to make sustainable and effective contributions to achieving UHC as well as other national health goals. Mobilization of domestic financial resources is key to moving closer to UHC and should be explored, harnessed and increased on a long-term basis. Government would need to form synergy with the private sector to realize this. Proceeds from such synergy are expected to add to government health expenditure to have a vibrant and robust effect on the health system. The expectation therefore calls for efficient implementation of the blueprints of the country's National Health Research Policy 2001, National Health Act 2014, and National Health Policy 2016 particularly the health financing and health research and development thrusts of the policies and assent of the National Research and Innovation Council Bill by the President of the Federal Republic of Nigeria. It is believed that these will accelerate and re-

invigorate the research drive, implementation and effective coordination particularly in the area of improving funding of the health system and health research. We share the optimism that these will significantly serve as ways to create enabling environment for research innovation and product development the country so desire as part of her technological advancement particularly in health delivery to flourish, and ultimately help improve the present poor health services and practice to achieve and sustain UHC by 2030 and beyond in Nigeria.

Competing Interests

The authors declare no competing interests.

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