

# Healthcare Expenditure And Health Outcomes In Sub-Saharan Africa: A Theoretical Analysis

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## Abstract

*This article provides a theoretical analysis of the relationship between healthcare expenditure and health outcomes in Sub-Saharan Africa, highlighting the dual challenges of underfunding and inefficiency. It examines key factors influencing expenditure, such as income levels, healthcare costs, education, demographics, and technological advancements. The analysis underscores the importance of strategic resource allocation, investment in preventive care, and addressing systemic inefficiencies. It also explores innovative financing mechanisms, regional collaboration, and governance reforms as pathways to enhance healthcare efficiency and accessibility. The findings advocate for a holistic approach to healthcare expenditure to achieve sustainable improvements in health outcomes and socio-economic development in the region.*

**Keyword:** Healthcare expenditure; Economics Growth, Healthcare Policies

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## I. Introduction

Since the last two decades, sub-Saharan Africa has made a slow and not-so-significant improvement in the provision of healthcare and education. Statistics have shown that since 2020, Africa has made limited progress on key health indicators, including decreasing mortality rates, maternal health, and communicable diseases, as well as an increase in the number of hospitals, physicians, and nurses, and life expectancy. As of 2024, over 600 million people in Africa lack access to adequate healthcare, and total government expenditure remains substantially inadequate. The population of Africa represents about 17 percent of the world's population but accounts for about 1.5 percent of global health expenditures. United Nations (2023) estimates show that the world population is 7.9 billion people, and projects that by 2050, the global population will be 9.7 billion people, and Africa's share is expected to be 26 percent. As of 2023, Africa contributed over 18 percent of the total global population. With the growth in population exceeding double digits, Africa's share of the global GDP is expected to rise from 2.4 percent, in 2024, to 4 percent in 2050. Africa is a continent experiencing high levels of poverty, income inequality, social injustice, human rights abuses, low literacy rates, lack of access to adequate healthcare, and lack of accountability and transparency. World Health Organization projects that there is a shortage of healthcare workers in Africa. This is reported, based on the ratio of physicians to the population, the needs of the population, and the prevalence of diseases, which is estimated to be 60 percent of universal health coverage.

United Nations estimates that the poverty rate has declined, and the share of Africans, who are classified as poor, fell from 55 percent in the '90s to 45 percent in 2012. UNDP sets various indicators to measure poverty levels in Africa. These indicators are captured in the Human Development Index (HDI). Some of these indicators include Life Expectancy at birth, average school attendance and expected school attendance, and per capita income. These indicators are interlinked, as low per capita income is related to low levels of literacy, and low literacy levels are linked to low health outcomes, and low health outcomes are linked to low productivity levels, which ultimately results in low GDP levels and low per capita incomes. Poverty results in ill health through under and malnourishment, lack of access to basic healthcare, lack of access to clean water, and poor sanitation. These are risk factors that contribute to major causes of high mortality and health challenges in Africa.

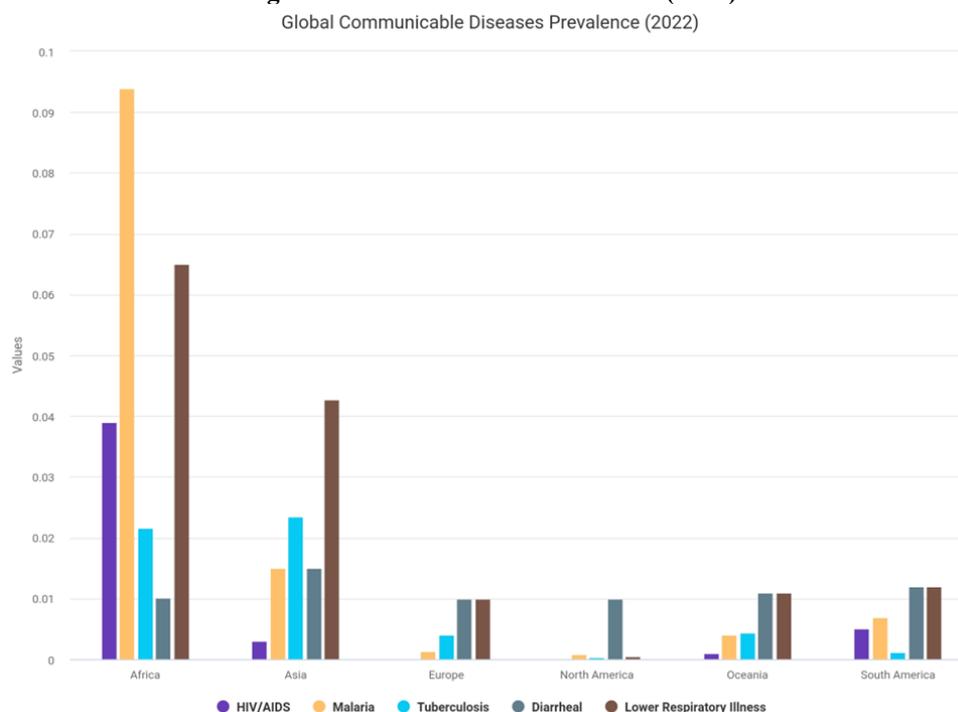
Statistics show that more than 25 percent of people who go to bed hungry, every day, live in the African continent. 20 percent of Africans are considered malnourished, and this represents the highest rate in the world. 30 percent of children age 11 and below suffer from growth disorders, and this results in physical and mental underdevelopment.

Sub-Saharan Africa is the region with the highest infant mortality. Reports show that four countries in sub-Saharan Africa have the highest infant mortality in the world. Apart from maternal complications in childbirth, and malnutrition, diseases such as diarrheal, malaria fever, and pneumonia are prevalent and lead to the early death of many children. Poverty is prevalent in Africa. 60 million children, who are aged between 4 and 16, assist by working, instead of schooling, by fighting poverty for their families, through child labor. The HIV prevalent rate in the sub-Sahara is the highest in the world. There are over 24 million (2022) people living with HIV, and this represents about 4.7 percent of adults between the ages of 15 and 49. As of 2023, over 26 million

people in sub-Saharan Africa were living with the scourge. Ten of the most HIV-ravaged countries in the world are in sub-Saharan Africa. South Africa has the most severe pandemic. Over 10 percent of all people infected with HIV/AIDS reside in and around the region of South Africa. It is estimated that the prevalence rate exceeds 20 percent in Lesotho, Zimbabwe, Botswana, and Eswatini. The global epidemic has its highest impact in sub-Saharan Africa. Estimates show that 68 percent of the 38 million global population living with HIV, as of 2021, were from sub-Saharan Africa. Sub-Saharan Africa was responsible for over 600,000 of the new 1.5 million infections, and half of AIDS-related deaths globally.

Africa has a population of over 1.5 billion people (2024). This represents 18 percent of the world's population and the second most populous continent. Africa's rising population simplifies its burden with health challenges. Africa has the burden of both communicable and non-communicable diseases such as diabetes, health-related diseases, chronic respiratory disease, and tuberculosis. Africa has a growing challenge with the shortage of healthcare workers. The continent has about 1.8 health workers per 1,000 people. This shortage affects the delivery of essential health services. 70 percent of African countries struggle with inadequate health infrastructure, and this includes, hospitals, clinics, medical supply chains, and medical equipment. This challenge limits access to quality healthcare. Oloribe et al (2019) observed that healthcare challenges in Africa, are encumbered by underfunding and neglect Funding of the health sector is a critical determinant of adequate access to healthcare. Africa has the lowest spending per capita, in healthcare. Fiscal constraints, corruption, inadequate fiscal spending, and prioritization of the healthcare sector. This has a huge impact on the availability of vaccines, medicine, and medical technologies. Political and social instability resulting from wars, civil strife, unrest, and social displacements, in Africa, have affected healthcare supply chain management and disrupted the delivery of healthcare services.

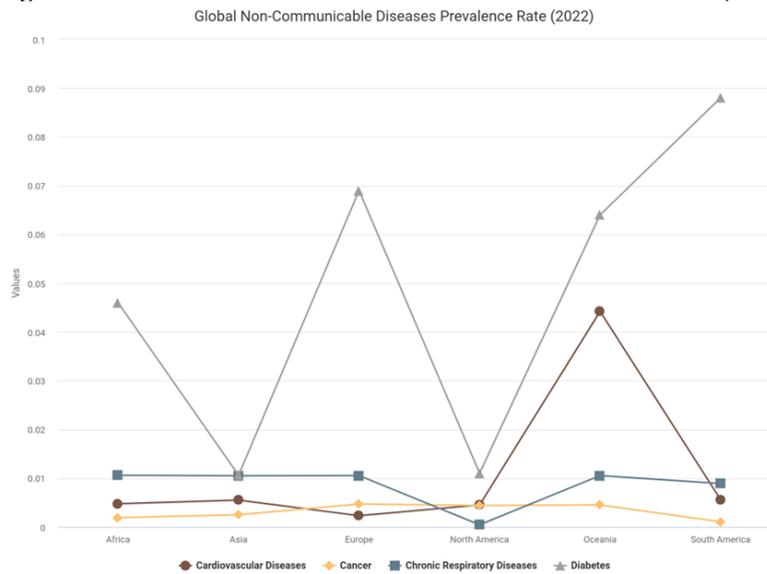
**Fig 1. Global Disease Prevalent Rate (2022)**



**Source:** Author's Compilation, World Health Organization Report 2022

Figure 1, depicts the prevalent rate of global communicable disease in the 6 regions of the world. The prevalence rate is determined by 100,000 of the population. Africa has the highest prevalence rate of HIV/AIDS, Malaria, and Lower Respiratory Diseases. 38 million people are living with HIV, and there are about 1.6 million new infections annually. There were over 250 million new malaria cases as of 2022 and over 650,000 reported deaths. WHO (2022) reported that an estimated 10 million people fell ill to tuberculosis, with over 1.5 million deaths. Non-Communicable diseases killed an estimated 45 million people globally, in 2021, and this is about 75 percent of deaths not related to the 2020 global pandemic. Cardiovascular diseases, Cancer, Chronic respiratory disease, and Diabetes are the prominent diseases that account for over 80 percent of all non-communicable deaths. 73 percent of all non-communicable deaths are in low-income and middle-income countries. It is estimated that cardiovascular diseases account for over 20 million deaths, in 2020.

**Figure 2. Global Non-Communicable Diseases Prevalence Rate (2022)**

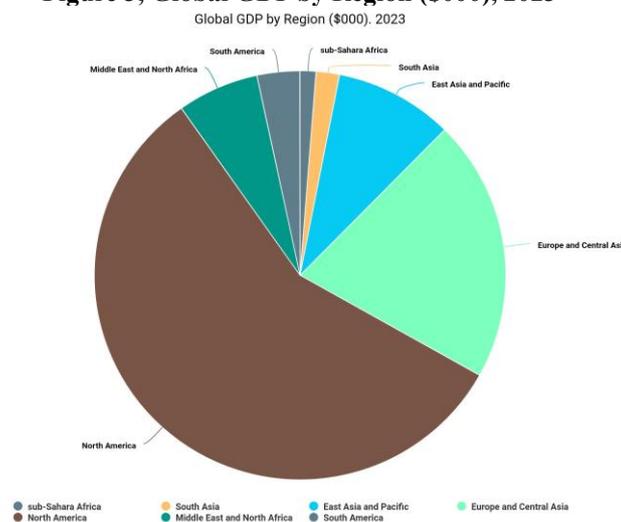


Source: Author’s Compilation. World Health Organization (WHO) Report 2022

In Figure 2, non-communicable disease rates are lower compared to other regions of the world, but in comparison to the early 2000s, the prevalence rate of non-communicable diseases in Africa has been rising, and this is due to changing lifestyles, thereby posing a significant health challenge. Estimates in 2019, showed that non-communicable diseases accounted for about 35 percent of deaths in sub-Saharan Africa. The population of people living with diabetes in Africa is expected to rise by over 200 percent, from 20 million, in 2022 to 45 percent by 2045. With the rise in urbanization in Africa, the prevalence of non-communicable diseases is expected to increase, and this will further pose a significant health challenge to public health administration.

Africa has a population growth rate of 2.37 percent as of 2023, with a population of 1.48 billion people, representing about 14 percent of the world’s population. Population continues to grow rapidly, and by 2050, it is expected to reach 2.5 billion people. As of 2024, the GDP of Africa was estimated to be about \$2.8 trillion in nominal terms. This figure accounts for about 2.5 percent of the global GDP. The incidence of low investment growth, government corruption, unrest, and political instability hinders GDP growth in Africa. Over 50 percent of the population of Africa lives below the poverty line. World Bank (2023) estimates that in sub-Sahara Africa, the per capita GDP of \$1,637 USD. This reflects the persistent economic challenges faced by the region, including infrastructure deficit, and reliance on agriculture. Azevedo (2017) asserted that Africa which accounts for about 12 percent of the world's population, has a disease burden of over 22 percent, and sub-Saharan Africa, contributing less than 1 percent of the global healthcare expenditure.

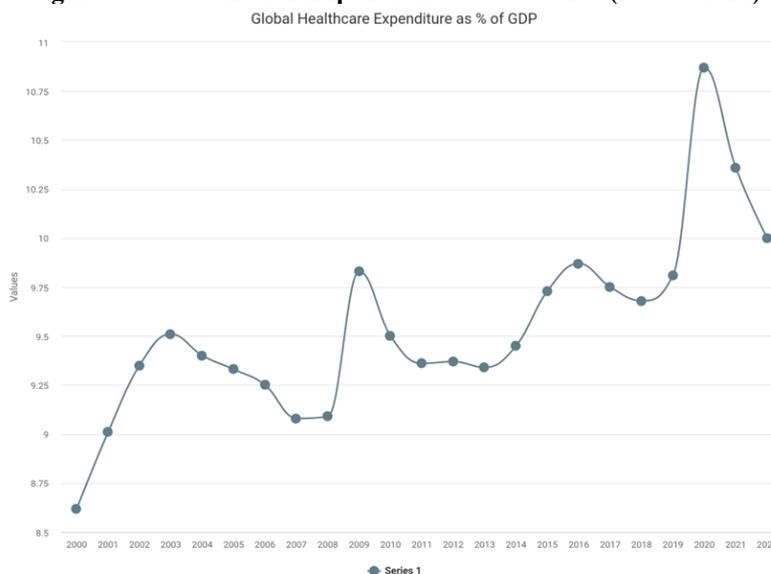
**Figure 3, Global GDP by Region (\$000), 2023**



Source: Autor’s Representation World Bank Report (2023)

In the figure, shows that Africa has the lowest per capita GDP in the world. This difference between Africa and North America is widening, suggesting global inequality. Countries in Asia, are ahead in per capita. Africa contributes about 2.39 percent of the global GDP, and North America, with a GDP of about 30 percent, is the highest in nominal terms. Europe and Central Asia is a staggering 20 percent. As of 2024, global expenditure on healthcare, as a percentage of GDP was estimated at 10.29 percent. This estimate shows a significant allocation of global resources to healthcare. World Health Organization (2024) reports showed a 12 percent increase from 8.62 percent in 2000 to 10.87 percent in 2020, due to the Covid outbreak, to 10.36 in 2021.

**Figure 4. Global Health Expenditure as % of GDP (2000 – 2022)**



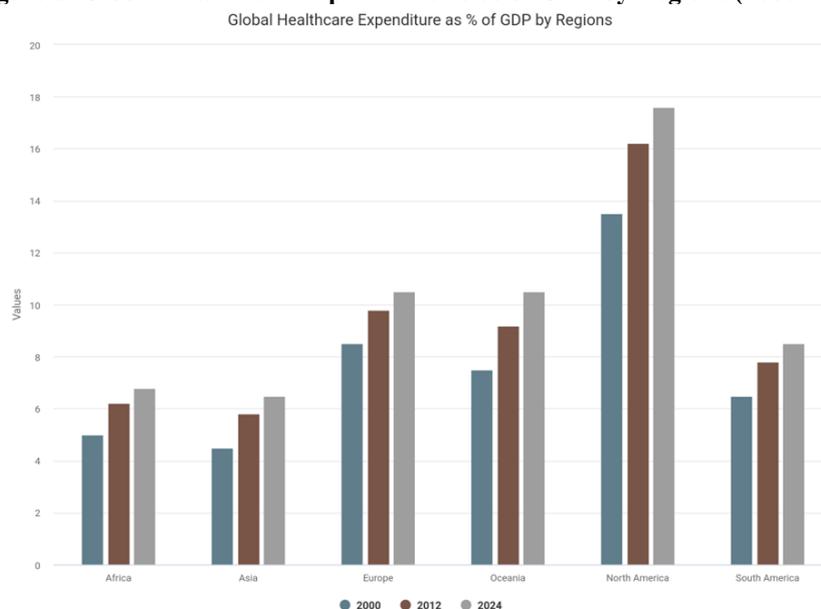
**Source:** World Health Organization Report, 2000 – 2022

Global healthcare expenditure rose significantly between 2000 and 2003, from 8.62 percent to 9.51 percent respectively. This increase was due to the rising cost of healthcare, the global AIDS epidemic, and increased emphasis on healthcare by governments and international organizations in prioritizing investments in communicable and non-communicable diseases. There was a sharp rise in global expenditure on healthcare between 2019 and 2020. This was due to the global COVID-19 pandemic that saw a staggering USD\$8.3 trillion, accounting for about 10 percent of total GDP. This required a substantial investment in infrastructure, vaccine development, and treatment. Overall, this massive investment in healthcare between 2019 and 2020 resulted in significant research and advancement in medical technology, rapid vaccine development, an increase in public awareness, and the development of expansive healthcare systems, including an increase in the number of hospitals, medical supply chain management, and testing facilities. In sub-Saharan Africa, the rise in healthcare expenditure saw an improvement in the provision and administration of healthcare and medical supply chain management, local production of medical supplies, expanded hospital facilities, private sector participation, and increased access to remote locations in Africa. Demissie et al (2020) emphasized the need for African countries to improve research and development efforts, and adopt innovation, which has been a major challenge to its healthcare sector.

Africa has an average per capita income of USD\$4,500 in purchasing power parity, and this varies significantly between countries. Poverty remains a significant challenge where about 420 million people live below the poverty line. With less than USD\$2.00 per day (2024), this figure accounts for about 30 percent of the total population. The major factors contributing to poverty in Africa include limited access to healthcare and education, unemployment, conflicts and political instability, civil strife, natural disasters, and climate change. Since 2000, there has been a significant effort at reducing poverty and improving access to healthcare and education. Governments in sub-Saharan Africa have made drastic shifts in emphasis on improving the poverty challenges by introducing strategies and initiatives, which are directed at achieving sustainable development goals, through healthcare improvements, social-political and economic empowerment, education programs, agricultural development initiatives, and social safety nets. There is a positive correlation between challenges in poverty and healthcare. 50 percent of the population of Africa has access to basic healthcare services, and this figure varies widely in remote locations. Poverty limits access to good nutrition, proper sanitation, basic hygiene, and clean water. A significant number of the population pay out-of-pocket costs to afford basic healthcare services. 40 percent of families cannot afford preventive treatments and care, and this has led to an increase in the

prevalence of communicable diseases. Cullinan (2021) highlighted that about 52 percent of Africans have access to basic healthcare needs, and this is due mainly to the quality of healthcare, which is generally below global standards.

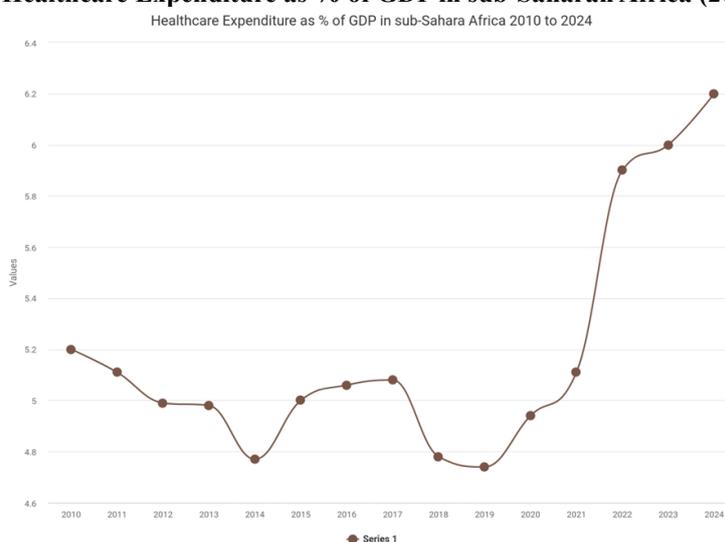
**Figure 5. Global Healthcare Expenditure as % of GDP by Regions (2000-2024)**



Source: WHO Global Health Expenditure Database (2000, 2012, and 2024)

Africa’s relatively low expenditure on healthcare as a percentage of GDP is mainly attributed to prioritizing constraints like education and infrastructure, the rapid growth rate in population, low per capita income and limited financial resources, and reliance on foreign aid to bridge the gap in funding. Asia’s constraints to low healthcare expenditure are also attributed to its population size, economic models and diversity, emphasis on economic growth, and a significant number of the population paying out-of-pocket, rather than through government spending on healthcare. In 2001 African Union countries committed to allocate about 15 percent of their annual expenditure on healthcare, however, progress has been slow. In Figure 5, as of 2024, a substantial amount of expenditure on healthcare exceeded 10 percent of GDP in North America, Oceania, and Europe. Many countries in North America, Oceania, and Europe expend a significant portion of their GDP on healthcare due to the high standards of healthcare, universal health coverage, public health programs, high expenditure on medical research and development, an aging population, and higher levels of GDP in these regions.

**Figure 6. Healthcare Expenditure as % of GDP in sub-Saharan Africa (2010 – 2024)**



Source: World Bank Group Data - 2024

In Figure 6, healthcare expenditure rose from 5.2 percent in 2010 to 6.2 percent in 2024. Africa has a global healthcare challenge, and this has a significant implication for the sub-region, and the world, at large. Expenditure on healthcare in Africa is significantly lower than in other regions. North America, Oceania, and Europe have an average of 17, 10, and 11 percent respectively. In South America, total expenditure averages 7.5 percent, with rapid expansion of access to healthcare. Asia has significantly lower expenditure, with a wide variation of access, and between higher and lower-income countries. Lacroix and Long (2024) asserted that the major reason for low healthcare expenditure in sub-Saharan Africa is the combined effect of economic growth and challenges with revenue mobilization, in the last decade. Many countries in sub-Saharan Africa do not prioritize expenditure on healthcare, this is due to a lack of political will, and an urgent need to raise the level of infrastructure. The United States spends an average of 16 percent of GDP on healthcare and has the highest healthcare spending in the world. In comparison to other OECD countries, the US spends more per person, the utilization rate does not differ significantly, and the healthcare price is higher than every other OECD country. This is more than five times the average of other wealthy nations. Overall, the US has lower life expectancy, worse health outcomes, and higher maternal mortality. Access to healthcare is limited, and residents do not have global coverage that guarantees basic healthcare, and affordability. Healthcare in OECD countries varies significantly, and average spending is estimated at 10 percent of GDP, residents are guaranteed universal coverage, ensuring that there is access to basic healthcare. Life expectancy is significantly lower in these countries.

World Health Organization defines healthcare outcomes as the extent to which health services for the population raise the likelihood of the desired state of health. Efficiency in healthcare represents the optimal use of resources, in reaching an optimal state of health.

$$\text{Efficiency} = \frac{\text{Health Outcomes}}{\text{Healthcare Expenditure}}$$

Efficiency in health outcomes measures the utilization of resources, for the best desired results.

Healthcare outcomes could include factors such as life expectancy, mortality rate, and quality-adjusted life years. Therefore,  $HO = f(LE, MR, QLA, RR) \dots(1)$

Where:

HO = Healthcare Outcomes

LE = Life Expectancy

MR = Mortality Rate

QLA = Quality-Life Adjusted

RR = Readmission Rates

In equation 1, improvement in HO would be determined by implementing strategies that positively impact each of the independent variables (*LE, MR, QLA, RR*). To raise life expectancy, investment in preventive healthcare is a crucial factor, and these include vaccinations, health screenings, and initiatives to tackle non-communicable diseases. Secondly, reducing mortality rates involves improving maternal and child healthcare services, addressing causes of preventable deaths, through medication and education, can lower mortality rates. Thirdly, enhancing the quality of life requires a patient-centered approach, providing care for acute and chronic conditions, improving mental health services, and ensuring rehabilitation programs for those recovering from illnesses or surgeries, all these contribute to improved and better quality of life. Fourthly, reducing the levels of readmission rates will result in improvement in post-discharge care for patients, and this includes providing clear instructions for patients, ensuring they have access to follow-up on appointments, and taking advantage of improved technology such as remote patient monitoring to track progress in health wellbeing.

$$\text{Also } HE = f(Y, P, E, A, T) \dots (2)$$

Where:

HE = Healthcare Expenditure

Y = Income Levels

P = Price of Healthcare Services

E = Education attainment

A = Age distribution of the Population

T = Technological Advancement

Some of the factors that influence the efficiency of healthcare demand in Africa include, the state of infrastructure, the shortage of trained professionals, insufficient government spending, as a percentage of GDP, corruption and lack of political will and governance, the burden of diseases, and high prevalence of infectious and non-communicable diseases impacts healthcare systems, education and the level of awareness which results from low level of literacy among the growing population make it difficult to implement preventive measures, and low level of international support, and weak health systems in Africa. In equation 2, changes in the dependent variable (HE) would result from changes in the income levels, price of healthcare services (P), educational attainment of the population (E), the age distribution (A) which when skewed toward an aging population, would

raise demand for more healthcare services, and technological advancement (A) can raise the level of government spending as well as lead to efficiencies that reduces cost. However, the age-distribution factor depends on the demographic profile of the population.

The demand for healthcare is derived from the overall desire for a state of complete physical and mental well-being, and not necessarily free from diseases. In Africa, the demand for healthcare is mainly for the treatment of acute medical conditions, preventive care, maternal and child health, mental health, and rehabilitation. Low income levels, poverty, literacy rate, aging population, the level of medical technology, and public awareness of general health issues, influence the desire to have good healthcare. Healthcare expenditure plays a crucial role in providing and improving healthcare and meeting the demand for the overall state of health in Africa. Studies have shown that a 1 percent increase in healthcare expenditure can reduce the incidence and prevalence of communicable and non-communicable diseases, by 0.5 percent. The demand for healthcare in Africa results from several critical factors, and these include, disease burden where Africa carries over 24 percent of the world's disease burden but has only 3 percent of the global health workforce (WHO, 2022). Infectious diseases like HIV/AIDS, malaria, and tuberculosis disproportionately affect the region, alongside a growing prevalence of non-communicable diseases such as diabetes and cancer. Secondly, limited access to basic drugs and medicines exacerbates the numerous health challenges. Thirdly, Africa is largely rural, and many areas lack basic healthcare facilities and trained personnel. Sub-Saharan Africa has only 1.3 health workers per 1,000, and this is the lowest in the World. WHO (2021) recommends a minimum of 4.5 healthcare workers for every 1,000 people.

UNDP (2023) estimates show that Sub-Saharan Africa's population of 1.212 billion will grow to 2.5 billion by 2050. This growth will account for more than 10 percent of the global population during this period. Rapid population growth and urbanization will further increase the demand for healthcare services. The economic impact is staggering and poor health outcomes hinder economic growth and development, thereby making healthcare a priority for African nations. Addressing these issues requires a multi-pronged approach, including strengthening healthcare systems, improving infrastructure, and fostering partnerships between governments, private sectors, and global organizations. Sub-Saharan African nations can adopt several strategies to address the increasing demand for effective healthcare, and some of these strategies include, firstly, investing in building and upgrading hospitals, clinics, and laboratories, in the rural areas where access to healthcare is limited. The use of modern technology, like telemedicine, can also help to bridge the gaps in service delivery. Secondly, training and expanding the healthcare workforce, including doctors, nurses, and community healthcare workers, could reduce the increasing brain drain to other regions of the world.

In summary, this article explores the intricate and multidimensional relationship between healthcare expenditure and health outcomes in Sub-Saharan Africa, offering a theoretical analysis of the region's unique challenges and opportunities. It begins by recognizing the historically low levels of healthcare funding across many African nations, which has hindered progress toward improved health outcomes. The article identifies key factors influencing healthcare expenditure, including income levels, the cost of healthcare services, educational attainment, population demographics, and the pace of technological advancement.

The analysis underscores the importance of addressing systemic inefficiencies, such as corruption and resource mismanagement, which often limit the impact of existing healthcare investments. Preventive care, including vaccination programs and health education campaigns, emerges as a cost-effective strategy for reducing the long-term burden of diseases. Investments in healthcare infrastructure, workforce development, and modern technologies such as telemedicine and data analytics are identified as critical areas for increasing the efficiency and reach of healthcare services.

Additionally, the article emphasizes the potential of regional cooperation and partnerships with international organizations to mobilize resources and share expertise. The role of regional and international partnerships cannot be overstated. Collaborative efforts with global health organizations, private sector stakeholders, and local communities can help mobilize resources, share expertise, and implement scalable solutions. It also highlights the importance of innovative financing mechanisms, such as national health insurance schemes and public-private partnerships, to ensure sustainable funding models that reduce the financial burden on individuals. Ultimately, the article advocates for a holistic approach that incorporates sound governance, community engagement, and attention to the social determinants of health—such as education, clean water, and nutrition. By aligning healthcare expenditure strategies with these priorities, Sub-Saharan African nations can make significant strides in improving health outcomes, fostering economic growth, and enhancing the overall quality of life for their populations.

In conclusion, the intricate relationship between healthcare expenditure and health outcomes in Sub-Saharan Africa underscores the need for strategic investments in health systems. While increased funding is essential, the effectiveness of expenditure hinges on addressing systemic inefficiencies, enhancing governance, and prioritizing preventive care. By fostering equitable access to healthcare and leveraging innovative solutions, Sub-Saharan Africa can pave the way for sustainable improvements in health outcomes, ultimately contributing to broader socio-economic development. The relationship between healthcare expenditure and health outcomes

in Sub-Saharan Africa reveals both challenges and opportunities. Increased financial investments in the healthcare sector remain a critical foundation for improving access to essential services. However, the key to transformative change lies in how these resources are allocated and utilized. Addressing systemic inefficiencies, such as corruption and resource mismanagement, is vital to ensure that funds reach the most vulnerable populations. Moreover, emphasis on preventive healthcare, including vaccination programs, health education, and early disease detection, can significantly reduce the economic burden of treatment and improve overall health outcomes. Strengthening health systems through investments in workforce development, infrastructure, and technology—such as telemedicine and data analytics—can bridge gaps in service delivery and enhance efficiency.

Ultimately, there are opportunities for growth in Africa. The digital transformation is sacrosanct, the use of renewable energy to power the healthcare system, and investment in this form of energy can have a lasting impact on healthcare. With a median age of 19.2 years, Africa has a growing labor force, and if well-educated and skilled, can drive productivity and economic growth. Global cooperation and partnerships with international organizations and private sector investors can provide the needed funding and technical expertise for infrastructure and development projects. Overall, achieving equitable and efficient healthcare systems requires political commitment, community engagement, and the integration of culturally sensitive approaches. As nations in Sub-Saharan Africa strive to meet their sustainable development goals, a holistic approach to healthcare financing and delivery will be instrumental in achieving improved health outcomes, fostering economic growth, and building resilient societies.

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