



# Journal of Health and Medical Sciences

**Egharevba, H. O. (2024), A Comparison of Healthcare Funding Systems between Low- /Medium-Income and High-Income Countries: Equity, Equality, and Fairness in the Rationing of Healthcare Resources. *Journal of Health and Medical Sciences*, 7(2), 23-31.**

ISSN 2622-7258

DOI: 10.31014/aior.1994.07.02.315

The online version of this article can be found at:  
<https://www.asianinstituteofresearch.org/>

Published by:  
The Asian Institute of Research

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# A Comparison of Healthcare Funding Systems between Low- /Medium-Income and High-Income Countries: Equity, Equality, and Fairness in the Rationing of Healthcare Resources

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## Abstract

Access to healthcare is a social right and its demand is universal. However, health resources are limited and have to be rationed justifiably which borders on societal values and the efficiency of the healthcare system. A more efficient health system will promote more equitable access to health care based on the principle of universal health coverage (UHC) advocated by the World Health Organisation. The efficiency of any health system depends on the structure of its funding or financing system. Evidence has shown that there is a strong correlation between country's income and total health expenditure. This also affects the health financing systems of countries. This discourse exposes the challenge of health inequities/inequalities and its correlation with health funding systems in low-income countries and upper-middle/high-income countries using Nigeria and the United States as reference countries. It also attempts to discuss the feasibility of attaining more equitable access to healthcare in a manner that promotes health equity and equality through economic evaluations of interventions in diseases of high socioeconomic burden and major health outcome concerns.

**Keywords:** Health Funding Systems, Healthcare, Inequities, Inequalities, Rationing, Cost-Effectiveness Analysis, Malaria, Cardiovascular Disease, Nigeria, United States

## 1. Introduction

Governments all over the world exist for the social good of the people and seek to improve the health status of their citizens. Improving the health status directly improved health outcomes such as disease morbidity and mortality, as well as quality of life. Better health outcomes are achieved through better health systems, and quality of living which may not be dependent on healthcare delivery alone but also on other social, economic, and environmental factors (Ejughemre *et al.*, 2015; World Health Organisation, 2006, p. 5). Thus, the structural framework for sustainable governance of a good health system is enormous, crosscutting, and intricate. It requires the development of human resources, the harnessing of financial resources, and the development or acquisition of appropriate infrastructure and technology for quality service delivery (World Health Organisation, 2006, p. 5).

Improving the quality of healthcare of the population is influenced by the level of access to healthcare services which is determined by access to qualified personnel, quality medications, appropriate technologies, nearby facilities, and alternative care. All these determinant factors are moderated by costs and health information and therefore can be affected by the income, educational status, and neighbourhood of the care recipient. Income and educational status are key indices that affect the socioeconomic status of individuals in a community, which in turn determine the social strata to which an individual belongs. Social strata of society affect the level of access to public facilities and amenities and raise the question of equity and equality (Donaldson and Rutter, 2018, p. 153-168).

Health as a basic need and a social right poses the challenge of equity and efficiency in the allocation of health resources, and raises the question of appropriate governance structure and the role of government in health systems. A good health system will promote good health outcomes, equity and sustenance of societal or cultural values (World Health Organisation, 2006, p. 5). As the custodian of inherent resources (natural and tax resources), and policies, government plays major roles in health systems development including planning, financing, and management, through appropriate mobilisation and equitable distribution of resources. The most critical of this is health system financing, which modulates the healthcare funding system and structure. Financial resources are the most cut-crossing and relevant to developing and acquiring other resources. However, like other resources, it is limited and presents healthcare with the challenges of rationing, equity, and efficiency (Scheunemann and White, 2011).

### *1.1 Worsening Inequality/Inequity and Sustainable Health Financing*

Rationing is the allocation of scarce resources based on perceived priority and/or overall benefits, which in health care inevitably requires withholding potentially beneficial treatments from some individuals. Fundamental to the discussion of rationing is whether the potential benefit is large enough or likely to occur to justify the expense. Thus, it borders on the consideration of societal values and the efficiency of the healthcare system. It is important to note that not all efforts to control healthcare costs involve rationing. Rationing requires the principles of distributive justice or equity, viz: “to each person an equal share,” “to each according to need,” “to each according to effort,” “to each according to free market conditions,” and “to each so as to maximize overall usefulness” (Scheunemann and White, 2011). In rationing, there is always a competing scenario between efficiency, equity (and equality), and “rue of rescue” or the innate human desire to save life or help alleviate the situation.

The current global inclination towards democracy and capitalism presents greater reliance on market forces for resource allocation. Thus, health systems across the world are financed through a mix of funding schemes from corporate and individual resources, which do not promote equity, equality, and fairness in the societal essence. The Corporate financial resources come from the government, private sector, and donors (international development partner organisations, and charitable non-governmental organisations), while individual resources come from personal out-of-pocket spending (OOPS) (McIntyre, 2007; World Health Organisation, 2006, p. 5).

Studies have shown globally that, there is a positive correlation between per capita income and/or gross domestic product (GDP) per capita, and total health expenditure. An analysis of national health accounts has shown that government spending, as a percentage of total health expenditure, has decreased over time in most middle- and low-income countries. This has raised the burden of healthcare costs on households and communities and has further worsened poverty and widened inequity (McIntyre, 2007; Umukoro, 2012; World Health Organisation, 2005).

In a bid to mitigate the worsening inequalities (and inequities) in access to health and promote Universal Health Coverage (UHC), the fifty-eight World Health Assembly (WHA 58.33) on sustainable health financing, universal coverage, and social health insurance, recommended the development of a health financing system in member countries that ensure access to essential health services and financial-risk protection through prepayment and pooling of resources (World Health Organisation, 2005). Thus, the financing mechanism advocated is one that can protect individuals from “catastrophic healthcare expenditure and impoverishment” as a result of accessing healthcare. The resolution also extends to the equitable distribution of good-quality healthcare infrastructures and

human resources to allow for equitable and fair access to quality care, within the macroeconomic, sociocultural, and political context of countries. The UHC is the focus of Sustainable Development Goal 3, Target 8 (SDG 3:8); and plays relevant roles in poverty reduction (SDG 1), gender equality (SDG 5), inclusive economic development (SDG 8), and reduction in general inequalities (SDG 10) (Adelakun, 2022). Contemporary approach to sustainable healthcare funding advocates progressive pool funding, risk-sharing and/or subsidy, and promotes the principle of ethical rationing involving equity, equality, and fairness in accordance with the principles of UHC (Adelakun, 2022; Ejughemre *et al.*, 2015; Raine *et al.*, 2016).

The ethical problem of inequity and inequalities is more pronounced in low- and medium-income countries and continues to challenge the attainment of UHC. This paper discusses the health financing systems of Nigeria and the United States of America as examples of low/medium-income and high-income countries, respectively. It attempts to describe the distribution of costs and benefits structure of programmes targeted at key healthcare outcomes of concerns, and the allocation of health resources within the context of equity, equality, and fairness.

## 2. Discussion

### 2.1. Health Funding System in Nigeria

A recent World Bank report indicates that 40% of Nigerians live below the national poverty line of about US\$1.93 per person per day, with many lacking education and access to basic infrastructure (electricity, safe drinking water, and good sanitation). The rural communities are worse off with about 52.1% poverty rate. Huge out-of-pocket expenditures are made on health and education, as well as an array of other non-food items such as transport, fuel, electricity, household items, and clothing (The World Bank, 2022a, p. 11-14)

The current World Health Organisation (WHO) national health account data on financing schemes as a percentage of current health expenditure (CHE) for the year 2020 estimates that in Nigeria, OOPS accounts for approximately 75%, while government schemes and compulsory contributory (social) health insurance schemes account for about 15% and 1%, respectively (WHO, 2023; The World Bank, 2023). This structure of healthcare financing which relies heavily on OOPS has not only proven to be unprogressive, and financially unprotective of the poor but also promotes inequality and catastrophic health spending, as well as impoverishment of the vulnerable group and the poor who live below US\$2 a day (Adekunle, 2022; Ayogu *et al.*, 2021; Olakunde, 2012; Oyibo, 2011). Fortunately, the recently signed National Health Insurance Authority Act (2022) gives a ray of hope to the poor and vulnerable. The National Health Insurance Authority (NHIA) Act made provisions for the vulnerable poor through the institution of the Basic Health Care Provision Fund (BHCPF) and Vulnerable Group Fund (VGF) for free healthcare coverage. The Act provides for mandatory health insurance for all residents, and incorporates mechanisms for the subnational (State) level actors to access the Funds. It promises to promote the fundamentals of UHC if properly implemented (National Health Insurance Authority, 2022).

#### 2.1.1. Malaria Morbidity and Mortality as Major Health Outcomes of Concern in Nigeria

Since 2010, malaria, HIV/AIDS, and lower respiratory infections have been the leading cause of disability-adjusted life years (DALYs), low quality of life, and unexpected deaths in Nigeria (Murray *et al.*, 2020; Institute for Health Metrics and Evaluation, 2023). A recent study indicates that malaria and neo-natal disorder are the leading causes of years of life lost (YLLs) by Nigerians (Angell *et al.*, 2022). The country accounts for 31.3% of global malaria deaths and also leads with 38.4% of malaria deaths in under-5 children (WHO, 2022, p. 17). Malaria has long been associated with poverty and is predominantly transmitted in poor neighbourhoods. It is responsible for catastrophic personal healthcare spending, and loss of income as a result of absence from work. A large portion of the OOPS segment of the total health expenditure of Nigeria is due to malaria (Ayogu *et al.*, 2021). Thus, reducing the malaria epidemic in the country will contribute greatly to the principles of UHC and the attainment of the already outlined SDGs (Adelakun, 2022).

Several interventions have been targeted at eradicating the disease in some communities and geo-locations in Nigeria with minimal success due to the unabating high transmission rate, poverty, and entrenched inequalities.

In cost-effectiveness analysis of malaria programmes such as vector control (through larvae source management (LSM) or insecticide-treated nets (ITNs) or long-lasting insecticide nets (LLINs)), seasonal malaria chemoprevention (SMC), and treatment with artemisinin-based combination therapies (ACTs), the distribution of costs cut across; (i) non-recurrent or indirect costs (capital cost such as building, machineries for specialized technologies or services for opportunistic ailments or co-morbidities), personnel (field, hospital consultation, laboratory analysis, and data); (ii) direct cost of intervention key items (i.e., nets, insecticides, machinery, and drugs), stationaries, supplies, information/education/communication (IEC), storage, training, distribution, administration, registration, data collection and analysis, telephone, transport, management, supervision, monitoring, hospitalization, non-specific costs (family caregiver and lost income, etc.), and (iii) utility-based cost such as unexpected deaths, related deaths, etc. (Avanceña *et al.*, 2022; Centre for the Study of the Economies of Africa, 2012; Conteh *et al.*, 2021). Effectiveness (benefits) have been assessed based on, (i) field activities or non-clinical outcomes such as doses administered, rounds of treatments (or doses) per year or season, nets distributed, cases tested, cases diagnosed (presumptively, rapid diagnostic test (RDT), microscopy), cases treated (complicated, severe, uncomplicated), degree of coverage, and retention in care or follow-up; (ii) clinical outcomes such as a reduction in transmission rate, parasitemia, new infections, and adverse events and serious adverse events (AE/SAE); and (iii) utility outcomes such as quality-adjusted life years (QALYs) gained, life years (LY) saved, healthy life years (HLYs), DALYs averted, number of persons protected, infant deaths averted, Children under-5 protected, clinical cases or episode averted, etc. (Avanceña *et al.*, 2022; Ayogu *et al.*, 2021; Conteh *et al.*, 2021; Gunda, and Chimbari, 2017).

Ezenduka *et al.* (2017) estimate that treatment of uncomplicated malaria consumes about 25% of the annual budget of public health facilities in Nigeria at the cost of over US\$31 per case, with personnel cost accounting for approximately 83% of the costs. An earlier study by Onwujekwe *et al.* (2013, as cited in Ezenduka *et al.*, 2017, p. 186) estimates between US\$30.42 and US\$48.02 as recurrent provider cost per case of malaria treatment for each outpatient and inpatient care, respectively, while US\$133.07 and US\$1857.15 were the non-recurrent provider costs per case, respectively. An analysis of the direct cost for treatment of uncomplicated malaria by Ayogu *et al.* (2021), indicates that the mean cost of antimalarial drugs (using artemisinin-based combination therapies [ACTs]) per treatment episode was \$1.96, which is higher than the specified poverty line of US\$1.93. The cost outlay from reported studies suggests that the cost of treatment of a single episode is above the Nigerian poverty line, thus, making treatment unaffordable for poor and vulnerable groups i.e., children, adolescent girls, women, the elderly, malnourished people, and those who are ill or with pre-existing health conditions or disabilities, as defined in the National Health Act (2014). The study by Conteh *et al.*, (2021) also substantiates this position.

Given the cost-benefits outlay of malaria treatment, a method of distributing costs and benefits will have to consider the vulnerable groups in order to adapt programmes towards more equitable healthcare access. For instance, the inclusion of the BMPC and VGF in the NHIA Act, which is a step in the right direction. The VGF allows the vulnerable to access health insurance for free without paying the required enrollees' premium, co-payment of 10% for drugs, and co-insurance for specialized treatment of laboratory investigations covered under the partial exclusion list (National Health Insurance Scheme, 2012, p. 17). However other economic and financial incentive programmes such as conditional cash transfer, transport reimbursement, and hospital meals may help to bridge the widening gap in equity and equality since this will promote accessibility and affordability among the vulnerable. Although the distribution of public health facilities may be considered fairly equitable, the same cannot be said about private facilities which are concentrated in the urban centers. Likewise, the distribution of qualified personnel is inequitably skewed toward the urban settlements (Adegoke *et al.*, 2017; Azodoh and Obitube, 2022; Kum, 2020, p. 27-34; Uneke *et al.*, 2007). A 2021 data from The World Bank (2022b) shows that about 47.25 % (100,840,661) of Nigerians live in rural areas, which also house the majority of the poor. Hence, there is a need to provide more facilities and personnel for more equitable access to healthcare.

## 2.2. Health Financing System in the United States of America

In contrast to the financing structure in the Nigerian health system, the WHO national health account data for the United States of America (USA) indicate the structure of health funding as OOPS (10%), government schemes

(33%), compulsory (social) health insurance schemes (22%), compulsory private insurance schemes (29%), and the balance is spread between voluntary health insurance scheme (1%), and non-profit institutions serving households financing schemes (4%) (WHO, 2023). According to the 2019 data from the Pan American Health Organisation (2021), the leading causes of death and disabilities in the USA are cardiovascular disease (CVD), where Ischaemic heart disease (15.2%), and stroke (6.7%) are major contributors. Other contributors to CVD include circulatory diseases, hypertensive heart disease, cardiomyopathy, myocarditis, endocarditis and rheumatic heart disease. This is unlike the low-/medium-income countries in sub-Saharan Africa where infectious diseases, such as malaria and HIV/AIDS, are the leading causes of death.

### 2.2.1. Cardiovascular Disease (CVD) Morbidity and Mortality as a Major Health Outcome of Concern in the US

According to the Centers for Disease Control and Prevention (CDC), about 805,000 people have heart attacks each year, and CVD was responsible for 695,000 deaths (about 20%) in 2021 (CDC, 2023a). The disease correlates with certain lifestyle behaviours. Some interventions targeted at risk reduction through lifestyle changes such as promoting smoking cessation, physical activity, and quality diets, have shown conditional effectiveness (Smith *et al.*, 2019). The cost-effectiveness analysis of CVD interventions has shown cost outlays covering the cost of programme personnel, cost of serious adverse events (stroke, acute myocardial infarction, surgery), and other direct costs (laboratory diagnostic tests, drugs, hospitalization, follow-up, point-of-service cholesterol/diabetes screenings, physical activity programme, tobacco control programme, etc). Although output and outcome targets may include lower blood cholesterol, lower blood pressure, and blood sugar, the benefits in cost-effectiveness analysis (CEA) are usually assessed using utility indices such as QALYs gained, and DALYs averted (McCreanor *et al.*, 2018; Smith *et al.*, 2019). Since clinical effectiveness and cost-effectiveness are considered important in determining insurance coverage in the USA, the use of utility indices which makes CVD programmes cost-effective in the long run confers a necessary advantage to the care receiver. Fortunately, However, the use of CEA (CUA) in policy and decision-making remains a contentious issue. (Eze-Nliam *et al.*, 2015).

Like Nigeria, and though in a different context and framework, health inequity has remained a persistent challenge in the US (CDC, 2023b). Some racial and ethnic minority groups are discriminated against in terms of access to health compared to their white counterpart. People living with disabilities and people from some racial and ethnic minority groups, rural areas, and white populations with lower incomes are more likely to face multiple barriers to accessing healthcare (CDC, 2023b). The CDC has tried to mitigate the problem of inequities through programmes like “Health Equity in Action” which uses best practices to spotlight projects that align with CDC’s CORE (Cultivate, Optimize, Reinforce, Enhance) commitment and shares the lived experiences of communities advancing health equity. With respect to CVD, regular checks for CVD risk factors, and focused lifestyle change programmes among vulnerable groups such as poor neighbourhood could promote equity. A recent review by Cheng *et al.* (2023) suggests that ensuring food security and diet quality could close CVD morbidity and mortality gaps among socioeconomic strata and prioritizing such interventions among high-risk groups in a multi-level approach could reduce inequity.

## 3. Implication

In consideration of sustainable health care financing and UHC, health inequity (and inequalities) based on race, ethnicity, and socioeconomic disparities, especially due to education, income, and neighbourhood, is a global challenge, which needs to be addressed in the true essence of distributive justice due to unavoidable rationing of limited resources (Scheunemann and White, 2011). Existing healthcare financing in Nigeria, which is highly dependent on OOPS with consequent huge economic burden, catastrophic spending, and impoverishment of the poor and vulnerable groups is regressive and unsustainable. Such a financing system is inimical to the principle of UHC, unlike the US where OOPS is relatively low and there is a fair mix of the financing structure among different schemes (WHO, 2023).

Over 90% of the Nigerian population is at risk of malaria, and associated OOPS is mainly spent on consultation, drugs, laboratory diagnostic tests, and transport. Vulnerable groups are unable to afford these costs and acquire preventive ITNs (LLINs). Moderating equity (and equality) of service requires careful consideration of

programmes and the targeted population (Raine *et al.*, 2016). Programmes of vector control targeted at poor neighbourhoods are appropriate since they promote equity (and equality) of access to ITNs (LLINs), and a better environment through larvae source management (LSM). The seasonal malaria chemoprevention (SMC) programme with ACTs also has the potential of promoting equity in malaria prevention and treatment if properly implemented. For the treatment of clinical cases, the NHIA Act has provided for the BHCPF and VGF for free healthcare service. The envisaged challenge with the Funds will be the availability of a reliable national social registry of the poor and vulnerable from the National Social Safety Nets Coordination Office (NASSCO) of the National Social Investment Programme (NSIP), the advocacy and effective engagement of stakeholders, and coordination of the HIS by NHIA. Since not everyone is captured under the vulnerable group, the sustainable financing of malaria healthcare services will require the progressive pooling of funds and efficient insurance schemes.

Likewise, ration within cardiovascular disease healthcare service in the US is a matter of between surgery (including hospitalization) and the various lifestyle change programmes. The challenge of inequities (and inequalities) that creates discrimination among minority groups and certain races by care providers could be addressed by the provision of adequate facilities, stricter monitoring of standards in poor neighborhoods, and the institution of a more transparent system of reporting the quality of service by care receivers. Perhaps the major challenge that may be confronting the US government is how to maintain or further reduce the OOPS from the current 10% to possibly less than 5% so that a sizeable proportion of its population is not subjected to catastrophic health spending (Jalali *et al.*, 2021).

#### 4. Conclusion

Resources are limited but needs are not. This imbalance creates the need for rationing of resources based on priorities. The concept of rationing requires the principle of distributive justice and equity. Disparities in the socioeconomic status of individuals or groups in the population result in health inequalities and inequity. Attempts at addressing health inequities led to the adoption of the concept of sustainable health financing through health insurance, and the proclamation of UHC by the WHO (WHO, 2005). The structure of health funding systems across the world varies from country to country with similarities within national income brackets. The structure is a mix of financial resources from corporate (government, private, and donor organisations) and individual resources (OOPS) (McIntyre, 2007; World Health Organisation, 2006, p. 5). While health funding systems are well distributed across pool-funding and insurance schemes with minimal OOPS in high-income countries like the US, the system is poorly distributed in low-/medium-income countries like Nigeria, where it is highly skewed towards OOPS resulting in catastrophic spending. This places a huge economic burden on the poor and vulnerable in the lower socioeconomic stratum, which negates the principles of UHC.

Achieving equity in the rationing of resources for malaria treatment and elimination in Nigeria requires careful consideration of strategy for reducing OOPS especially among the vulnerable groups. The provisions of the NHIA Act (2022) will appropriately respond this OOPS by vulnerable groups if properly implemented. A well-planned vector control and SMC programmes targeted at more vulnerable neighbourhoods and populations could also provide palliative measures for equity. The US could promote equity in CVD healthcare by improving health insurance coverage and focusing lifestyle change programmes on poor neighbourhood and vulnerable groups.

**Acknowledgment:** I wish to acknowledge the University of Suffolk United Kingdom, for the knowledge and insights gained in the course of my postgraduate study in public health.

**Ethics approval and consent:** The review article did not involve the use of biological samples or materials and therefore does not require consent or ethical approval. There was no primary data or material used in this article.

**Conflict of interests:** There is no specific competing or conflicting interest recognized concerning any entity or issues mentioned in the article other than to enlighten the targeted audience and stakeholders in promoting health equity in health systems.

**Funding:** This was no specific funding for the development of this review.

**Author's contribution:** The author developed every aspect of the manuscript, and undertook the review for publication.

**Authors' information:** HOE is currently pursuing a postgraduate degree in public health at the University of Suffolk, UK. He has extensive experience in translational research especially in preclinical and clinical drug discovery research, and he is currently a trial-site principal investigator of COVID-19 vaccine fractional dose trial in Nigeria.

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