



# Challenges Facing the Department of Health Economics in Contributing to Health Planning in Sudan: A Case Study

Salma Yahia Khatir<sup>1</sup>, Habbani K<sup>2</sup>, Fatima Elhassan<sup>2\*</sup> and Gabrallah S<sup>3</sup>

<sup>1</sup>Ahfad University for Women, Sudan

<sup>2</sup>Alsudani Center for Training in Health Economics, Sudan

<sup>3</sup>Mubadrat Consultancy Khartoum, Sudan

**\*Corresponding author:** Fatima Abdelrahman Elhassan, Health Economist, Vice director of Alsudani Center for training in Health Economics, Khartoum, Sudan, Email: fatima.elhassan@yahoo.com

## Research Article

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## Abstract

**Introduction:** Health planning is crucial for health sector to ensure better health provision for the people so the engagement of different aspects like economics concept is very important. This study examines the challenges facing the Department of Health Economics in contributing to health planning, with a specific focus on Sudan. The study aims to provide an in-depth understanding of the obstacles encountered in integrating health economics into the planning process.

**Methods:** A descriptive, analytical qualitative case study approach. Data was collected through in-depth interviews with participants from federal level and state level representing the five zones in Sudan, ensuring a comprehensive representation of the country healthcare landscape. Data was analyzed using thematic analysis.

**Findings:** The study reveals that the Departments of Health Economics in Sudan faces significant challenges in supporting health planning. Key obstacles includes: Inadequate infrastructure, Political instability, Insufficient funding, Limited and inaccurate data, hindering evidence-based policy recommendations, Funding constraints, limiting comprehensive research and Shortage of qualified healthcare workers impeding the implementation of health economics concepts.

**Conclusion:** To overcome these obstacles, close collaboration is essential. Prioritizing health economics research and building up the workforce are identified as crucial steps towards improving the contribution of health economics to effective health planning in Sudan.

**Keywords:** Health Economics; Health Planning; Sudan; Healthcare Challenges; Qualitative Research; Policy Implementation; Workforce Development

## Abbreviations

COVID-19: Coronavirus Disease 2019; FMOH: Federal Ministry of Health; JICA: Japan International Cooperation Agency; M and E: Monitor and Evaluation; NASA: National

Aids Spending Assessment; NHA: National Health Account; PER: Public Expenditure Survey; PETS: Public Expenditure Tracking Survey; PHI: Public Health Institute.

## Introduction

Health economics is a specialized branch of economics, emerged in the post-World War II era as a distinct field focused on efficiency, effectiveness, and value of resources in health and healthcare production and consumption. It applies economic theories and models to examine resource allocation within the health sector, covering areas such as healthcare service demand and supply, health insurance, cost-benefit analysis of healthcare programs, and health technology assessment [1-3].

The field's evolution was marked by significant milestones. Oskar Lange's 1937 paper on the economic theory of socialism laid early foundations for applying economic analysis to the health sector. Kenneth Arrow's seminal 1963 paper on medical economics analyzed the unique features of healthcare markets. The first health economics textbook, published by Victor Fuchs in 1972, further solidified the field's academic standing [4].

As health economics developed, its focus areas expanded. The 1960s and 1970s saw emphasis on national health insurance, physician supply and payment, and the role of health in labor productivity and human capital. The 1980s onwards witnessed growth in research on health behavior, regulation of insurers and pharmaceuticals, equity in health and healthcare, and empirical methods for health policy assessment [5].

Parallel to health economics, health planning emerged as a critical discipline. It involves a systematic approach to identifying health problems and needs, developing solutions, allocating resources, and implementing and evaluating health policies and programs. Effective health planning is crucial for optimizing resource allocation, setting priorities, and improving health outcomes at national, regional, and local levels [6-9].

In Sudan, the journey of health economics and planning began much later than in many other countries. After gaining independence in 1956, the establishment of a national health policy aimed at expanding health services, supported by government funding and international aid (Post-Independence Initiatives).

During the socialist period under President Nimeiri, Sudan implemented a policy of free health services, aiming to provide universal access, including the establishment of rural health units (Introduction of Free Health Services 1970s).

Economic difficulties and political changes led to the decline of free health services, increasing pressures on the

health system (Challenges and Decline of Free Services 1980s).

In response to financial constraints, the government began implementing user fees for health services, shifting the burden onto patients and reducing access for low-income populations (Introduction of User Fees 1992).

The government established a national health insurance scheme aiming to increase access to health services and reducing out-of-pocket expenditures for citizens (Introduction of Health Insurance 1994).

Ongoing conflicts severely disrupted health services and financing, leading to reliance on humanitarian aid (Impact of Civil Wars 1985-2005). Introduction of community-based health insurance and public-private partnerships to enhance financing (Health Financing Reforms 2010s) [10].

The Sudanese government's decisions regarding health financing often lacked evidence-based foundations and thorough economic analysis due to several factors: Decisions were frequently driven by political goals rather than health needs, The absence of robust health data collection systems limited the government's ability to gather the necessary evidence for informed decision-making, Many policies were implemented as short-term responses to crises, such as conflicts or economic downturns. This reactive approach led to decisions made without considering long-term implications or sustainability.

Limited Stakeholder Involvement, Reliance on External Funding (Much of the health financing came from international donors, which influenced the government's priorities. Funding was often directed towards immediate humanitarian needs rather than long-term health system strengthening, leading to decisions made without solid economic justification).

The government initially focused on expanding basic health services and infrastructure without strong economic analysis or planning. The establishment of the Public Health Institute (PHI) in the 1970s at the University of Khartoum marked an early step in developing public health and management expertise.

However, health economics remained a niche subfield in Sudan until the 2000s. A significant leap forward came in 2003 when the University of Khartoum launched the first graduate program dedicated to health economics and financing, in partnership with Harvard School of Public Health. This initiative helped develop national expertise in the field.

Although the first department of health economics was established at Khartoum state ministry of health in 2003, later in 2005 the federal ministry of health established the department of health economics under planning directorate to generate economic evidence for planning and priority-setting.

Since the establishment of health economics department, many studies was conducted by the department: six rounds of National Health Accounts (2008-2020) producing a sound information about the amount and pattern of health expenditure as well as the main actors in Sudan health financing system, and three rounds of National AIDS spending Assessment (NASA), Public Expenditure Review (PER) and Public expenditure tracking Surveys (PETS).

The year 2008 saw the formulation of a Health Sector Strategic Plan, utilizing economic analysis and modeling to set priorities and budgets [11].

Conventional economic theory has led policymakers to primarily address “market failures” by investing public funds only when private investment is insufficient. However, a more proactive approach is necessary, where policymakers actively shape an economy that prioritizes human and planetary well-being. This involves not just filling financial gaps but ensuring that funding is equitable and just [12].

Despite these advancements, Sudan’s Departments of Health Economics at federal and states levels faces significant challenges that constrain its effectiveness. These include:

- Insufficient funding and staffing
- Limited access to quality data
- Weak governance mechanisms hindering coordination with stakeholders
- Shortage of locally-relevant research and tools tailored to the Sudanese context
- Difficulties in translating knowledge into action

These challenges severely impact the department’s ability to conduct robust analyses, evaluate interventions, provide policy recommendations, and ultimately influence health outcomes positively [13,14].

The integration of health economics and planning is crucial for evidence-based decision-making and efficient resource allocation. Economic analysis identifies costs and benefits of health interventions, facilitating priority-setting and guiding policymakers in maximizing health gains under budget constraints. Health planning translates this economic evidence into concrete policies, plans, and budgets that align resource distribution, service delivery, and population health

priorities [15].

Addressing the barriers faced by Departments of Health Economics in Sudan is vital. This includes improving capacities, enhancing collaboration, and developing context-specific resources. More research is needed to fully understand and address these persisting impediments, so that targeted capacity-building and integration strategies can be devised.

By overcoming these challenges, Sudan can better leverage health economics for evidence-based planning and progress in meeting its pressing health needs. This would elevate the country’s health planning process from reliance on precedent or arbitrary political factors towards a data-driven, goal-oriented framework that can vastly improve health system functioning and, ultimately, the health outcomes of the Sudanese population.

This study aims to explore the challenges facing the department of health economics in its contribution to health planning in Sudan. The research will investigate the role of the health economics department in health planning at both federal and state levels of the Ministries of Health. Additionally, it will examine how the health economics department contributes to strengthening Sudan’s health system and discuss the implementation of health economics concepts across various states ministries of health in the country.

The study will delve into the major factors influencing the application of health economics in Sudan, seeking to answer crucial questions about the challenges faced by the health economics department in contributing to health planning. It will explore the role of health economics in overall health planning, assess whether effective health planning is possible without utilizing health economics concepts, and evaluate the importance of the health economics department in improving health services.

By addressing these objectives and questions, this research aims to provide a comprehensive understanding of the current state and potential of health economics in Sudan health system, ultimately contributing to more effective health planning and improved health outcomes for the population.

## Methods and Material

### Study Design

Descriptive, analytical qualitative case study to gain an in-depth understanding of the topic.

## Study Area

Sudan's healthcare system is organized into five primary zones, each facing distinct socio-economic challenges, while also being structured under the governance of both federal and state ministries of health. The Northern Zone, which includes Khartoum, is urbanized and has better healthcare access but struggles with overcrowding.

The Eastern Zone deals with a high influx of refugees, which strains existing health services. In the Western Zone, particularly Darfur, the region suffers from conflict-related resource shortages. The Central Zone comprises mixed urban and rural populations, facing unique agricultural health issues. Lastly, the Southern Zone is affected by ongoing conflict and limited healthcare access, often relying on traditional medicine.

## Study Population

Employees in the department of health economics and employees in the department of health planning at federal and state level.

Inclusion criteria: states that have both health economics department and health planning department.

## Sampling

Sample technique: nonprobability purposeful mixed variation sampling. Purposeful sampling only targeting a specific population that appear to answer the research question.

## Sample Size

The research utilized a qualitative case study approach to gain an in-depth understanding of health economics and health planning across five distinct zones in Sudan. The sample size consisted of 10 participants selected from the Department of Health Economics and Health Planning in five states (Khartoum, River Nile, Blue Nile, South Darfur and Gadaref), ensuring representation from each of these zones.

Participants (one from health economics department and one from planning department in each state) been chosen based on their expertise in health economics and their ability to provide valuable insights into the operational dynamics of health planning within their zones. The selection process ensured diversity in perspectives, reflecting the varied healthcare landscapes across Sudan.

## Data Collection

Qualitative data collection was conducted through in-

depth interviews utilizing an interview guide. Some of the interviews were conducted face-to-face, while others were conducted via telephone due to the distances involved and the challenges of meeting in person.

The primary aim of questionnaire is to gather insights from employees in the health planning and health economics departments regarding their experiences, training, and perceptions of the role of health economics in health planning. This information will help identify gaps in knowledge and training, as well as assess the importance of health economics in decision-making processes.

This structured methodology aims to produce a comprehensive understanding of the role that health economics plays in health planning within Sudan's healthcare system, ultimately guiding improvements in training and resource allocation.

## Data Analysis

Data has been analyzed manually, using thematic analysis, which is "a method for identifying, analyzing and reporting patterns within data", thematic analysis is an initial and simple method of analysis. The goal of a thematic analysis is to identify themes, which are patterns in the relevant and important data, then use these themes to address the research question. Thematic analysis is not about summarizing data, it interprets and makes sense of them. To use thematic analysis, a qualitative thematic description of all data was attributed in the selected studies as codes and to build up themes out of these codes. In this study, key themes derived to make an analysis of data more convenient for answering the research question.

## Steps in used in the Thematic Analysis

- **Data Familiarization:** a comprehensive understanding of the content of the interview transcripts was gained through reading and re-reading the data to identify initial patterns and insights.
- **Generating Initial Codes:** preliminary codes created based on recurring ideas and concepts that emerged from the participants' responses. These codes served as labels for specific pieces of data that related to the challenges faced by the Department of Health Economics.
- **Searching for Themes:** the initial codes were grouped into broader themes that captured significant aspects of the data. For example, themes included "resource constraints," "lack of training," and "communication barriers." This step helped in organizing the data into meaningful categories.
- **Reviewing Themes:** the identified themes reviewed

and refined to ensure they accurately represented the data set as a whole. This involved checking if the themes were coherent and if they effectively captured the essence of the participants' experiences.

- **Defining and Naming Themes:** Each theme was clearly defined, and descriptive names that reflected their content were provided. This facilitated a clearer understanding of how each theme contributed to the overall narrative regarding the challenges in health planning.
- **Writing Up:** Finally these themes, were integrated into thesis, providing a detailed account of how they relate to the broader context of health economics in Sudan.

### Ethical Consideration

An official letter was obtained from the research committee of Ahfad University for Women and from the federal ministry of health. A verbal consent was obtained from selected health sectors. Each participant had assurance of confidentiality, as well as a commitment that the research findings would be used for research purposes only.

### Results

During discussions, a myriad of opinions filled the in-depth interviews, reflecting the diverse perspectives of the participants. They delved into various aspects of health economics, drawing from their extensive experience in the field. Topics such as mentoring budgets, tracking expenditure, costing and evaluating health services, national health system accounts and system of health accounts, and health financial management sparked passionate discussions. Each participant contributed unique insights shaped by years of practical involvement in their work domains. Their collective wisdom and expertise added depth and richness to the conversation, shedding light on the complex interplay between economics and healthcare. This discussion paved the way for innovative solutions and strategies to enhance the efficiency and effectiveness of health systems. The results will be discussed in the following themes.

#### Importance of Health Economics in Health Planning

**Importance of health economics in health planning:** Participants discussed the importance of health economics in health planning, revealing differing viewpoints on its significance. Some emphasized its role in providing crucial information for efficient resource allocation, while others highlighted its importance due to limited resources. Health economics was seen as bridging the gap between plan objectives and available budgets, recognizing its pivotal role

in resource allocation, cost-effectiveness, and evaluation of healthcare interventions.

Participants shared a common understanding of health economics' role in health planning, emphasizing its insights into resource allocation, healthcare access, outcomes, and efficiency. They stressed the importance of analyzing this information for informed decision-making, ensuring effectiveness, fairness, and cost-efficiency in healthcare.

A unanimous consensus emerged that health economics can identify the most cost-effective interventions, leading to improved health outcomes while efficiently using limited resources.

#### Engagement of Health Economics in Health Planning:

Most of the participants expressed active engagement in health planning, including strategic, annual, and operational planning. One participant hadn't personally participated but had been invited to workshops. Participants received comprehensive training in various planning aspects, funded by JICA and conducted by different institutions.

The Role of Health Economics in Strengthening of Health System.

#### Decision making and stakeholder engagement:

Participants agreed on health economics' significant impact on decision-making across healthcare levels. Some expressed concerns about the current state of the health economics department, viewing it as lacking strong influence. Health economics was seen as providing essential real-time information for planning and financial aspects.

Most participants acknowledged health economics as a roadmap for stakeholder engagement, particularly in resource-limited contexts. One participant voiced concerns about the Health Economics Department's subordinate structure, arguing for more independence and influence.

**Empowering Healthcare Workers:** Participants unanimously agreed on health economics' significance in empowering healthcare workers to understand resource distribution and utilization. It provides insights into incentives and disincentives influencing healthcare stakeholders, enabling informed decisions for optimal resource allocation.

**Rationalize Use of Resources:** All participants recognized health economics' crucial role in optimizing resource use. It provides a framework for evaluating cost-effectiveness of healthcare interventions, considering factors like effectiveness, disease prevalence, and patient population characteristics.

**Contribution to Private Sector:** Most participants agreed that current health economics studies primarily focus on

the government sector, neglecting the private sector. They expressed concern about this limited attention and called for greater inclusion of the private sector in health economics studies.

**Increase Investment in Health:** Participants highlighted how health economics can establish correct priorities while reducing unnecessary spending. Some expressed reservations about implementing health economics in Sudan, acknowledging the need for tailored approaches.

**Expand Provision of Services:** Participants recognized health economic studies' role in providing vital information for efficient resource utilization. Economic evaluation was emphasized as a crucial tool for comparing costs and consequences of various interventions.

**Improvement of Health Services Delivery System:** Participants agreed on health economics' significant role in analyzing efficiency and effectiveness of health services. It was seen as a powerful tool for evaluating healthcare systems, identifying improvement areas, and optimizing resource allocation.

**Country Goals:** Participants recognized varying degrees of health economics application in different health systems. They acknowledged challenges in health planning and emphasized the importance of health economics evaluation in facilitating excellent planning processes.

### The Implementation of Health Economics' Concepts in Sudan States' Ministry of Health

Opinions diverged on the approach used by administrations. Some reported a comprehensive approach using various methods, while most relied primarily on costing and budgeting. Participants highlighted specific applications of health economics, including budget mapping, expenditure tracking, and health service evaluation.

### The Major Factors Influencing Health Economics in Sudan

Participants agreed that numerous factors affect health economics, including social determinants, political stability, economic variables, and non-medical elements influencing health outcomes. Economy and politics were unanimously considered the most influential factors in health economics and healthcare systems.

## Discussion

### Role of the Health Economics Department in Health Planning

Health economics has essential role in health planning as it provides crucial data for decision-makers to allocate healthcare resources effectively and maximize benefits. It

helps planners manage complex healthcare systems and develop optimal policies despite financial constraints, bridging the gap between planning and economics departments [16,17].

Integrating health economics into planning enables policymakers to make informed decisions that improve health system efficiency, quality, and equity, ensuring resources are used in ways that yield the greatest health outcomes [18]. This integration supports the development of better healthcare systems and services [3].

Literature reinforces this role. Brown MM, et al. [19] found that high-quality economic evaluations are increasingly important for health technology assessments and influence coverage and reimbursement decisions, with a need for standardized methods. Mullins CD, et al. [20] observed that while some US accountable care organizations effectively use economic analyses, barriers to integration still exist and need to be addressed [21].

### The Role of Health Economics in Strengthening Health Systems

The findings reveal that health economics is crucial for enhancing healthcare systems, yet its application is limited in Sudan. The Ministry of Health in Sudan has provided short courses in economic analysis, cost-effectiveness, priority setting, and health finance, but the training capacity remains insufficient for supporting evidence-based planning and policy. Research indicates that high-quality health economics education not only builds technical skills but also empowers healthcare workers to contribute to decision-making. Narayan D, et al. [22] found that targeted training increased Indian health leaders' confidence in applying economic evidence, while other studies demonstrated that short courses enabled practitioners in low- and middle-income countries to integrate economic evidence into policymaking. Further investment in Sudan is needed to develop health economics capacity.

The results show that health economics offers a valuable framework for decision-making and can significantly influence healthcare choices, though its impact is limited by its current status as a technical subunit. Narayan D, et al. [22] outlined a curriculum that enhances local research and policy engagement skills, and Rabarison KM, et al. [23] noted that an online specialization improved graduates' ability to communicate evidence to decision-makers. For health economics to exert more influence, it should be reorganized as an autonomous department.

Health economics is vital for optimizing the use of limited healthcare resources, offering a framework to

evaluate various programs and procedures based on patient population, disease prevalence, and effectiveness. However, a systematic review by found limited use of health economics due to factors like relevance and timeliness, suggesting that health economists must engage stakeholders throughout the research process. Despite its importance, the use of health economics in Sudan remains insufficient for effective resource allocation [24,25].

The evidence also indicates a global trend of limited adoption of health economics, particularly in low- and middle-income countries like Sudan, due to issues such as research relevance and stakeholder engagement [26]. Additionally, current health economics research often overlooks the private sector, which is crucial for a comprehensive understanding of the healthcare system.

The challenges of applying health economics in different socioeconomic settings are recognized, emphasizing the need for specialized techniques and approaches tailored to local conditions. For instance, a study by Mills A [26] highlights that low- and middle-income countries often struggle with the integration of economic evaluations into their health policies due to issues such as limited data availability and stakeholder engagement. Health economics justifies increased health investment by quantifying returns and projecting workforce needs, as demonstrated by a systematic review conducted, which found that investing in health can lead to significant economic returns through improved productivity and reduced healthcare costs. Additionally, cost-effectiveness analysis demonstrates the economic benefits of priority interventions, helped identify demand for private health insurance and informed policy decisions regarding healthcare financing. This evidence attracts funding and supports market growth by identifying service gaps and new opportunities.

Health economics is instrumental in assessing healthcare efficacy and efficiency, pinpointing areas for improvement, and maximizing resource use. It highlights performance improvement opportunities through productivity, efficiency, and quality measures, and integrates health economics into management training and implementation research. However, health planning often lacks adequate focus, leading to challenges and deviations from plans. Health economics evaluations are essential for developing policies that promote universal health coverage and quality care through integrated public and private systems.

To fully realize the potential of health economics, increased collaboration between health economists and private stakeholders is necessary. This will enhance research, business acumen, and health economics literacy, ultimately supporting private sector growth and national health goals

[27-30].

### **The Implementation of Health Economics Concepts in the States' Ministry of Health in Sudan**

The study indicates that various health economics techniques, such as costing, budgeting, supply/demand analysis, economic evaluation, and financial tools, are utilized by state administrations. However, budgeting and costing are predominantly used, with other health economics tools being employed infrequently. This highlights potential missed opportunities for improved resource allocation and decision-making. The variations in practice suggest different levels of acceptance of health economics and underscore the need for further research into diverse approaches within administrative systems.

Conventional economic theory has guided policymakers to focus primarily on addressing "market failures," often limiting public investment to situations where private funding falls short. However, a more proactive approach is essential. Policymakers should actively shape an economy that prioritizes human and planetary well-being, moving beyond merely filling financial gaps. This requires ensuring that funding is equitable and just, fostering a more inclusive and sustainable economic environment [12].

Implementation of health economics varies by country income level. A 2020 analysis showed that over two-thirds of global master's programs in health economics are concentrated in high-income countries like the US, UK, and Canada. These countries also have well-established health technology assessment processes that use economic evaluation. In contrast, lower-middle-income countries exhibit limited implementation and infrequent use of economic evidence for priority-setting [31,32].

### **The Major Factors Influencing Health Economics in Sudan**

The study identifies several key factors affecting health economics in Sudan, including social determinants, political stability, income inequality, unemployment, and other socioeconomic issues. These factors influence the access to and availability of healthcare supplies. Political and economic processes are the primary drivers shaping health systems and resource allocation. Overall, the research highlights that health economics operates within a broader sociopolitical context, which ultimately affects the quality, cost, and accessibility of healthcare.

Health economics operates within a broader sociopolitical context that impacts system-level challenges

such as affordability, accessibility, and quality. Improving health economic outcomes requires addressing political, economic, and social drivers alongside technical health system factors [33].

The study highlights the significant role of health economics in efficient health planning and the major obstacles faced by Sudan's Department of Health Economics. Challenges include a shortage of qualified staff, inadequate financing, limited data access, weak institutional frameworks, and a lack of locally relevant research. To address these issues, there is a need for consistent investment in education and training, as well as strategies to retain qualified health economists within government roles.

Overcoming financial constraints and data limitations requires increasing budgetary resources and improving data collection methods. Strengthening institutional structures and governance can enhance coordination between the Department of Health Economics and other stakeholders. Local research and context-specific methodologies are crucial for addressing Sudan's unique needs.

A multifaceted approach involving investment in capacity building, increasing financial support, improving institutional frameworks, and fostering collaboration is essential. By addressing these challenges systematically, Sudan can fully leverage health economics to enhance planning, optimize resource use, and improve health outcomes. The study provides guidance for policymakers to strengthen the integration of health economics into the health sector for a more effective healthcare system.

## Conclusion

To sum up, this thesis shows how important health economics can be to evidence-based health planning and policymaking by using tools like demand analysis, priority-setting frameworks, and economic evaluation to maximize the limited resources available for healthcare. But in order to effectively use health economics, Sudan now faces significant obstacles, such as a lack of local research and training capacity, a lack of policymaker ability to apply economic findings, and a failure to integrate health economists into planning procedures. It will take coordinated efforts to develop technical proficiency, involve stakeholders, encourage collaborations between government and academia, and solve structural obstacles in order to fully achieve the prospective of health economics.

It will require collaboration and commitment, but investing in the development of the health economics area will greatly enhance health planning and, eventually, enhance the performance of Sudan's health system.

## Recommendations

- Building a health economics network to involve the 18 states of the country to update information and share experiences.
- Strengthen funding and resources by advocating for increased government and international support to enhance the capacity of the Department of Health Economics, enabling it to conduct comprehensive research and analyses.
- Improve data collection by developing a robust health information system to ensure accurate and accessible data, facilitating evidence-based policy recommendations and effective health planning.
- Enhance Workforce Capacity by investing in training programs for healthcare professionals in health economics to build a skilled workforce capable of conducting relevant analyses and implementing health policies.
- Promote Collaboration by Foster partnerships between the Department of Health Economics, other government sectors and private sector to improve coordination and integrate economic evidence into health planning processes.
- Implement evidence-based policies by encouraging the adoption of evidence-based approaches in health planning through integrating economic evaluations and research in health financing and investments into decision-making processes, ensuring that resource allocation aligns with national health priorities. Research is essential for identifying effective interventions, understanding health trends, and informing policy development.

## Limitations

- Limited Data Availability: The research has constrained by a lack of comprehensive and reliable data, which affects the ability to conduct thorough analyses and derive accurate conclusions.
- Insufficient Local Studies: There is a scarcity of locally relevant studies and research, limiting the ability to tailor health economics approaches to the specific context of Sudan.
- Resource Constraints: The thesis has face limitations due to insufficient funding and resources available for health economics initiatives, affecting the depth and breadth of the research.
- Political and Economic Instability: Political and economic instability in Sudan impact the implementation of health economics strategies and affect the overall reliability of the research findings.
- Institutional Weaknesses: Weak institutional frameworks and governance structures hinder the



effective application of health economics principles, impacting the study's relevance and applicability.

- **Capacity Issues:** The shortage of qualified health economists and limited training opportunities affect the ability to address and analyze health planning challenges comprehensively.
- **Generalizability:** Findings from the study specific to Sudan's context and may not be easily generalizable to other low- and middle-income countries with different health system dynamics.
- **Stakeholder Engagement:** Limited engagement with key stakeholders may affect the comprehensiveness of the study and its ability to address practical challenges and solutions effectively.

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