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RESEARCH ARTICLE

Investigating the Determinants of Universal Health Coverage (UHC): A Cross-National Analysis of Sustainability and Governance Factors in 194 Countries

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Abstract:Universal Health Coverage (UHC) is of utmost significance as it guarantees that every individual can access essential healthcare services of adequate quality without facing financial hardship, thereby fostering health equity and economic stability. The COVID-19 pandemic has highlighted the importance of UHC by exposing substantial deficiencies in healthcare systems and the severe repercussions of insufficient health protection. UHC also plays a fundamental role in attaining the Sustainable Development Goals (SDGs), including SDG 3, which seeks to guarantee optimal health and well-being for all ages.This study is anchored in theories of health equity and governance, emphasizing the interconnections between sustainability dimensions and institutional quality. It explores how environmental, social, and economic sustainability, political stability, government effectiveness, and health expenditure (as a share of GDP) are associated with the achievement of UHC in 194 countries. Using secondary data from World Bank (2023) and a correlational design, regression analysis were performed in SPSS 23, supplemented with correlation matrices and multicollinearity tests (VIF) to enhance robustness.Findings indicate that social and economic sustainability show the strongest associations with UHC, while environmental sustainability and government effectiveness display moderate links, and political stability and health expenditures as a percentage of GDP demonstrate weaker effects. Multivariate linear regression analysis revealed that the Social Sustainability, Economic Sustainability, and Environmental Sustainability are highly significant predictors of change in the Universal Health Coverage. The presence of potential, not serious multicollinearity among economic sustainability, social sustainability and government effectiveness On the other hand, environmental sustainability, political stability, and health expenditure demonstrate acceptable VIF values, indicating no multicollinearity concerns for these variables. The study contributes by providing an exploratory understanding of structural factors correlated with UHC performance, offering practical insights for policymakers to strengthen health system sustainability.

Keywords:Universal health coverage, Society sustainability index, Social sustainability, Economic sustainability, Environmental sustainability, political stability, government effectiveness, health expenditures as % of GDP.

INTRODUCTION

Numerous challenges, including the growing number of elderly people, staff shortages, and rising healthcare costs, are currently facing the global healthcare sector. These concerns are placing a significant strain on institutions, medical professionals, employees, patients, and communities. As a result, the current resources and procedures cannot sustain the increased need for services and assistance. Hospitals are progressively relying on technology and automation to alleviate the burden on an already delicate system (Zebra Technologies, 2022).

This study is anchored in the political economy of health framework, which emphasizes how governance, social determinants, and economic policies interact to shape health system performance. In addition, the World Health Organization's health system building blocks (WHO, 2000) and the sustainability theory of the "three pillars" (economic, social, environmental) provide complementary theoretical lenses to situate UHC within both governance and sustainability debates. Together, these frameworks establish a stronger theoretical grounding, addressing a gap identified in earlier research.

Health is a crucial component of the Sustainable Development Goals (SDGs). The SDG 3.8 objective is to attain universal health coverage (UHC), which includes ensuring financial protection against health risks, providing access to high-quality essential healthcare services, and ensuring the availability of safe, effective, high-quality, and affordable necessary medications and vaccinations for everyone. Furthermore, the implementation of UHC could potentially contribute to or be constrained by other SDGs, such as SDG 1 on poverty eradication, as healthcare costs push about 90 million individuals into poverty annually (Derakhshani et al., 2020).

The study uses the Sustainable Society Index (SSI) and Sustainable Development Goals Index (SDG Index) to quantify social, environmental, and economic sustainability. The Sustainable Society Foundation

creates the SSI, which encompasses sustainability in a comprehensive manner, following the traditional three-pillar framework of human welfare, environmental welfare, and economic welfare. The three aspects of well-being consist of seven categories and include a total of 24 indicators. The SSI employs geometric means to combine the scores of the indicators for the three aspects of well-being, with equal weights across indicators (Wehrmeister et al., 2020).

To accomplish the SDGs, the global community has pledged to an ambitious development agenda to enhance the health and well-being of every person worldwide (WHO, 2018). Making progress towards UHC is a policy priority for both countries and global institutions, as highlighted by the UN Sustainable Development Goals agenda and WHO Thirteenth General Program of Work (GPW13). Global society is undergoing rapid transformations in the realms of economy, environment, technology, and demographics, all of which have significant impacts on health and overall welfare. Ensuring universal access to high-quality healthcare is a significant priority for health systems worldwide, and it is a key issue on the political agenda of rapidly growing nations (Kruk et al., 2018).

The current study aims to explore the extent to which sustainability factors (environmental, social, economic), political stability, government effectiveness, and health expenditure as a percentage of gross domestic product are statistically associated with the Universal Health Coverage Index. Importantly, the design is correlational rather than causal, and the findings should be interpreted as associations that may guide, but not definitively establish, pathways of influence.

Monitoring the UHC index in different countries and comprehending the influence of various factors on UHC is of utmost importance. It is essential to provide equitable and cost-effective access to high-quality healthcare services for all individuals without exclusion. The effectiveness and sustainability of UHC enhances the coordination and support that nations provide to achieve the health goals outlined in the 2030 SDGs (Derakhshani et al., 2020).

However, despite extensive global interest in UHC and sustainability, there remains a lack of research directly linking governance dimensions—such as political stability, government effectiveness, and public expenditure on health—to UHC outcomes in a cross-national context. Previous studies often treat sustainability and health system performance separately, leaving a critical gap in understanding how these elements interact. This study addresses that gap by integrating sustainability indices with governance indicators, offering an exploratory framework to explain variations in UHC performance across countries.

Accordingly, this study addresses the following research questions:

- To what extent are governance effectiveness, political stability, and health expenditure statistically associated with UHC outcomes?
- How do sustainability dimensions (environmental, social, economic) interact with governance factors in relation to UHC performance?
- What policy-relevant insights can be drawn by comparing cross-country variations in these associations, while acknowledging the study's correlational design?

Theoretical background

The Sustainable Society Index (SSI)

The Sustainable Society Index (SSI) and Sustainable Development Goals Index (SDG Index) are benchmarks used to assess social, environmental, and economic sustainability. McGuinn et al. (2020) show that the Sustainable Society Foundation initiates the development of the Sustainable Society Index. There are 21 indicators that collectively reflect the three elements of well-being. The dimensional aggregation of indicators guarantees equal weight to each indication (McGuinn et al., 2020).

However, its relationship with other elements of sustainable development and social development challenges remains unclear (Boström, 2012). Boström's (2012) contribution highlights the difficulty of operationalizing social sustainability within broader development frameworks, as social goals often lack clear indicators compared to economic and environmental ones. This theoretical debate suggests that while the SSI provides a useful composite index, it may only partially capture the multidimensional and context-dependent character of social sustainability. The notion of social sustainability is a dynamic term that varies over time and location, rather than being an absolute or consistent concept (Janssen, 2024).

Furthermore, environmental sustainability is closely tied to healthcare access. For instance, exposure to air pollution, unsafe water, and climate-induced disasters can increase disease burdens and overwhelm health systems, thereby impeding progress toward UHC. This aligns the environmental pillar of SSI with WHO's recognition of environmental determinants of health, positioning sustainability as more than a background condition—it is an integral factor shaping health system equity and resilience.

Furthermore, theories such as the "Health in All Policies" (HiAP) framework highlight how social and environmental sustainability directly influence population health and health equity, strengthening the rationale for including SSI dimensions in UHC studies (Kickbusch & Gleicher, 2012). Similarly, the ecological public health model suggests that health systems are nested within broader environmental and social contexts,

reinforcing that sustainability indicators cannot be treated as external to health system performance (Lang & Rayner, 2012).

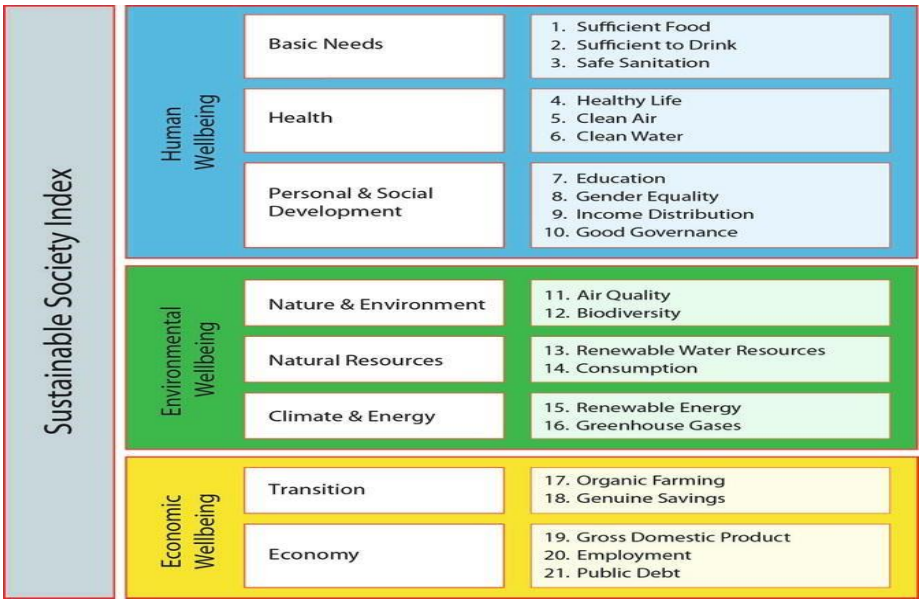

Figure (1) Framework of Sustainable Society Index SSI
Source: (Taroni, 2022)

Political Stability

The Political Stability and Absence of Violence/Terrorism index evaluates the likelihood of unconstitutional or violent methods, such as politically motivated violence and terrorism, leading to the destabilization of the government (Ranabhat et al., 2020).

Government instability has a detrimental impact on individual health due to its association with the quality of the healthcare sector. Conversely, democracy positively impacts individual health due to its correlation with income. The political stability index ranges from -2.5 (indicating weakness) to 2.5 (indicating strength) (Ranabhat et al., 2020). From a political economy of health perspective, political stability shapes the predictability of health financing and long-term investment in UHC, even though stability itself does not guarantee equity or efficiency in outcomes.

From a governance theory perspective, the stability of political institutions underpins the predictability of financing, law enforcement, and regulation—all central to UHC implementation (Kaufmann et al., 2011). Additionally, the political economy of health framework suggests that stable regimes create more conducive environments for long-term investments in primary health care, while instability erodes trust and weakens state capacity to deliver equitable coverage (Marmot, 2005).

Government Effectiveness

The Government Effectiveness index is a component of the international governance indicators, which consists of six aspects. This assessment measures the public's opinions on various aspects, including the effectiveness of public services, the competence and impartiality of the civil service, the effectiveness of policy development and implementation, and the government's trustworthiness in upholding these policies. The government effectiveness index ranges from -2.5 (poor) to 2.5 (strong) (World Bank, 2021).

Within the WHO health systems framework, government effectiveness is theoretically linked to stewardship and governance functions. Effective governments are better positioned to regulate healthcare markets, enforce accountability, and allocate resources in line with UHC principles, thereby making it a key explanatory factor in cross-country comparisons.

The concept of "good governance for health" developed by Siddiqi et al. (2009) provides an expanded lens here, emphasizing participation, rule of law, transparency, responsiveness, and accountability as critical determinants of health system outcomes. This theory strengthens the link between governance effectiveness and equity in UHC provision.

Health expenditure as a percentage of Gross Domestic Product (GDP)

Increasing government spending on health as a percentage of GDP does not imply a reduction in spending on other social services. Instead, it serves as a foundation to support the idea of increasing both the government's ability to gather resources and its spending on all aspects of human rights and factors that influence health in cases where governments are currently not

providing the maximum resources available (Meheus & McIntyre, 2017). However, empirical findings remain mixed. In many low- and middle-income countries, higher health expenditure does not always translate into improved UHC outcomes, due to inefficiencies, weak governance, or inequitable allocation of resources. This highlights the conditional nature of the expenditure–UHC link: spending is necessary but insufficient, unless paired with institutional capacity, efficiency, and accountability mechanisms.

The "Resource Dependency Theory" (Pfeffer & Salancik, 1978) supports this view by arguing that financial resources alone do not guarantee performance; rather, the ability of institutions to mobilize and allocate these resources effectively determines outcomes. Similarly, Musgrove's health financing theory (1996) highlights that risk pooling, prepayment, and equity in allocation are critical mediators between expenditure and UHC progress.

Universal Health Coverage (UHC) index

Universal health coverage (UHC) index: Measuring the amount of effective coverage in the healthcare system is crucial for determining if health services are in line with a country's health characteristics and are of sufficient quality to meet the health requirements of all age groups in the population (Lozano et al., 2020).

The World Health Organization (WHO) and the World Bank releases a framework for measuring Universal Health Coverage (UHC). This framework defines service coverage as a range of services that includes promotion, prevention, treatment, rehabilitation, and palliation throughout a person's life. (Lozano et al., 2020).
The Universal Health Provision (UHC) Index is on a scale from 0 (representing the lowest level) to 100 (representing the highest level). The study determines this index by taking the geometric mean of 14 tracer indicators, which indicate the extent of health service provision. Figure (1) lists the tracer indicators below, categorizing them based on the four components of service coverage (WHO, 2022), reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access

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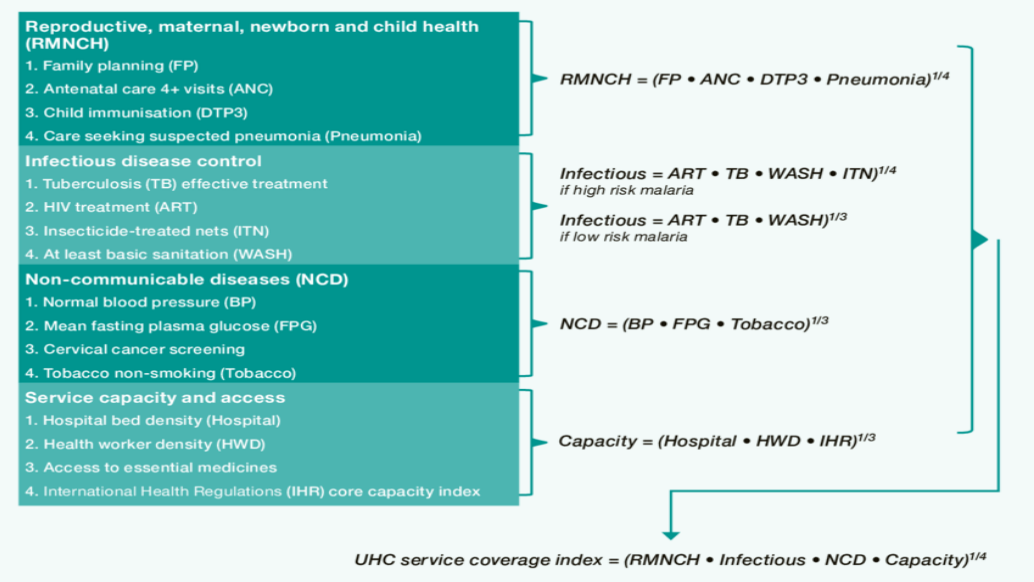

Figure (2) Universal health coverage index Source: (WHO, 2022)

Beyond the WHO/World Bank framework, the "health systems building blocks" model (WHO, 2007) provides a theoretical foundation for linking inputs (financing, governance, workforce) to service coverage and health outcomes. More recent scholarship, such as the "path dependency theory" in health reform (Pierson, 2000), suggests that past policy choices constrain current UHC trajectories, reinforcing the importance of historical governance and financing patterns in explaining variation across countries.

By situating UHC alongside sustainability and governance indicators, this study draws on a multi-framework approach (WHO building blocks, SSI, and governance theory) to explain variation in coverage outcomes. Rather than asserting causality, these theoretical anchors justify why the selected factors are plausible correlates of UHC performance.

Conceptual framework.

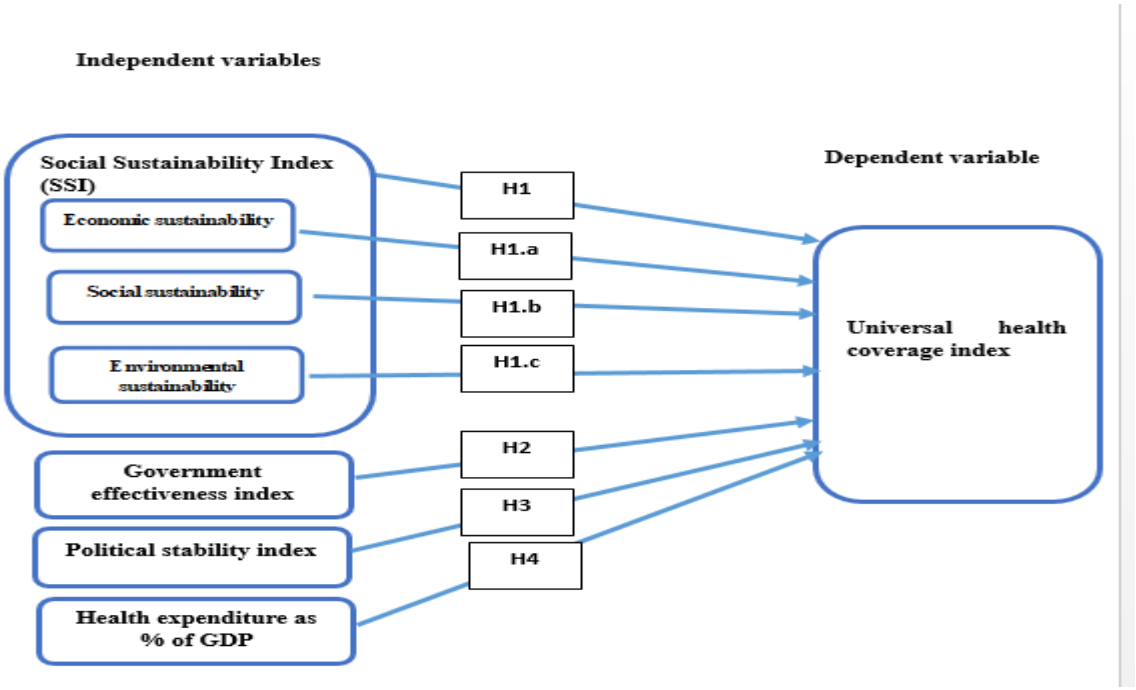

Figure (3) Conceptual framework
Source: (Prepared by the researcher)

Literature review and hypotheses development

The Effect of Social Sustainability on Universal Health Coverage

Social sustainability significantly impacts the Universal Health Coverage (UHC) index by influencing the accessibility, affordability, and quality of healthcare services. Social determinants of health (SDH), such as socioeconomic status, education, and employment, are crucial for equitable health service delivery and should be integrated into UHC monitoring frameworks to reflect the social gradient and complexity of social stratification (NG & Fong, 2022).

Countries with high poverty rates and large informal economies often struggle with inadequate tax revenues, which hampers the funding of healthcare services and limits access to care, thereby lowering the UHC index (Khan et al., 2019). The decomposition of UHC indices shows that richer socioeconomic groups contribute more to the index, highlighting quality care, addressing fundamental issues like equity and the social determinants of health (Scheil-Adlung, 2013). The role of government and private bodies in promoting rehabilitation and providing sufficient access to effective services is also crucial for achieving UHC and improving the UHC index (Rezaeian, 2019). Overall, social sustainability, through its impact on socioeconomic factors and healthcare financing, plays a pivotal role in determining the UHC index and achieving sustainable health outcomes for all (Odugleh-Kolev & Parrish-Sprowl, 2018).

Based on the above studies the hypothesis could be formulated as follows:

disparities in healthcare access (MV et al., 2022). Additionally, the health workforce's distribution, skills, and working conditions are vital for service availability and quality, directly affecting the UHC index (Behera et al., 2021). Community engagement and a shift toward people-centered health services can enhance the delivery of

H1.a: Social Sustainability is positively associated with Universal Health Coverage.

The Effect of Economic Sustainability on Universal Health Coverage

Economic sustainability significantly impacts the Universal Health Coverage (UHC) index, as it determines the ability of a health system to provide continuous, equitable, and quality healthcare services without financial hardship to the population. For instance, demographic shifts in Mauritius threaten the financial sustainability of the health sector, requiring an additional USD 137 per person by 2060 to meet the health needs of an aging population, equivalent to 0.6% of the GDP (Nundoochan, 2023). Similarly, insufficient GDP growth in Italy jeopardizes the sustainability of universal coverage, emphasizing the need for immediate intervention by health professionals and financial regulators to prevent health financing shortages (MV et al., 2022).

Taiwan's National Health Insurance (NHI) system, despite its high efficiency and satisfaction rates, faces

ongoing financial sustainability challenges due to imbalances between expenditure and revenue, necessitating continuous reforms and political negotiations (Ng & Fong, 2022). The importance of sustainable healthcare financing is also evident in the Asia-Pacific region, where countries like Japan face threats to their health insurance systems due to aging populations, emphasizing the need for equitable and sustainable financing models (Ahid, 2022). It is also important to do economic analyses to make sure that UHC has the best return on investment and will last (Mangoya et al., 2023) because health benefits packages (HBP) in low- to middle-income countries use cost-effectiveness analysis (CEA) and budget impact analysis to plan them.

Studies in Asian and African countries have shown that when socioeconomic factors are added to UHC indices, the index shows that richer socioeconomic groups contribute more. This shows that there are differences that need to be fixed for the economy to truly be sustainable (Herguedas, 2020). Therefore, achieving UHC requires robust economic strategies, including affordable social health insurance, equitable resource allocation, and sustainable financing policies to ensure health systems' resilience and effectiveness (Mwangi, 2019). Drawing from the previously mentioned studies, the study can formulate the hypothesis as follows:
H1.b: Economic Sustainability is positively associated with Universal Health Coverage.

The Effect of Environmental Sustainability on Universal Health Coverage

According to Putnis & Neilson (2022), environmental sustainability significantly impacts the Universal Health Coverage (UHC) index by influencing various determinants of health and healthcare delivery. Health systems are major polluters, contributing approximately 4.6% of global emissions, and improving the quality of care can either mitigate or exacerbate environmental impacts depending on the approach taken. The interdependence between human health and environmental health is evident, as environmental degradation leads to increased mortality and morbidity from conditions such as air and water pollution, which are responsible for an estimated 13 million deaths annually (The Lancet, 2022).

Integrating environmental health (EH) into UHC is crucial, especially in low- and middle-income countries (LMICs) where economic insecurity and pollution exacerbate health disparities (Haider & Bibb, 2017). The Sustainable Development Goals (SDGs), particularly SDG 3, emphasize the need for a robust environment-economic-health nexus to ensure the successful implementation of UHC (Cerf, 2019). Moreover, equitable access to healthcare and environmental resources is essential for achieving UHC, as disparities in these areas continue to affect health outcomes globally (Herguedas, 2020). Improved sanitation, access to clean water, and electricity are critical indicators that correlate with better health outcomes and sustainable development (Khan et al., 2019). Urban sustainability, which aims to reduce the ecological footprint, also impacts health expenditures and the overall health of the population, further underscoring the importance of integrating environmental sustainability into health policies to enhance the UHC index (Hussin et al., 2023). Therefore, a comprehensive approach that includes environmental sustainability is essential for improving the UHC index and achieving global health equity. Drawing from the previously mentioned studies, the hypothesis can be formulated as follows:
H1.c: Environmental Sustainability is positively associated with Universal Health Coverage

The Effect of Government Effectiveness on Universal Health Coverage

Government effectiveness plays a crucial role in the success of universal health coverage (UHC) initiatives, impacting various aspects, such as health system performance, financial protection, and equitable access to health services. Effective coverage, which integrates need, use, and quality, is a powerful metric for assessing health system performance and tracking UHC progress (Ng et al., 2014).

Studies have shown that government spending on health does not always directly translate to improved health indices, indicating that the efficiency and effectiveness of spending are critical. For instance, Thailand's UHC policy, which expanded public health insurance and removed financial barriers, significantly improves equity in health care use and financial protection, particularly benefiting poorer populations (Fadlli et al., 2019). Similarly, Ghana and Burkina Faso's UHC reforms have enhanced maternal and child health outcomes, although the effectiveness varied based on the support and implementation strategies (Vasyunina & Lipatova, 2022). Furthermore, studies have demonstrated that public spending on health and education significantly enhances social indicators, underscoring the importance of efficient resource allocation and utilization (Chisadza et al., 2021). Drawing from the previously mentioned studies, The hypothesis can be formulated as follows:
H2: Government Effectiveness is positively associated with Universal Health Coverage.

The Effect of Political Stability on Universal Health Coverage

Political stability plays a crucial role in achieving and maintaining a high Universal Health Coverage (UHC) index. Stable political environments facilitate effective governance, which is essential for implementing health policies and ensuring consistent health financing. For instance, countries with stable political systems, such as those in the Cooperation Council for the Arab States of the Gulf (CCASG), have successfully provided UHC due to their robust economies and governance structures (Ranabhat et al., 2020). Conversely, political instability,

as seen in the Central African Republic, can lead to health crises in neighboring countries like Cameroon due to refugee influxes and disease spread, thereby degrading health performance (Ndokang & Tsambou, 2015). Research indicates that excellent governance and political stability are positively associated with higher UHC indices, as they enable better health expenditure management and policy implementation (Mosca et al., 2020).

The experiences of countries like Thailand and Mexico show that political commitment and stable governance are pivotal in achieving UHC, even amid economic challenges (Templin et al., 2021). In contrast, fragile states and those in conflict often lag in UHC due to governance issues and lack of political stability (Kumar, 2016). Furthermore, as observed in high-income countries during economic recessions, political crises can lead to health system instability, underscoring the importance of stable political environments in maintaining health systems (Novignon et al., 2021). Based on the above studies the hypothesis could be formulated as follows:
H3: Political Stability is positively associated with Universal Health Coverage

The Effect of Health Expenditure as Percentage of GDP on Universal Health Coverage
Higher health expenditure relative to GDP is generally associated with better UHC outcomes, as it enables broader service coverage and improved financial protection. For instance, a study found that every 1% increase in GDP allocated to health expenditure is associated with a 3.7% lower percentage of children with early childhood caries (ECC), indicating a direct positive impact on specific health outcomes (Folayan et al., 2021). In India, the long-term cointegration of GDP and tax revenue with public health care expenditure suggests that higher income and revenue generation positively impact health care spending, which is crucial for progressing toward UHC (Behera & Dash, 2017). Moreover, a comprehensive analysis of UHC performance across countries reveals that higher GDP per capita and increased health spending are significantly associated with better service coverage and financial protection, both key components of the UHC index (Wagstaff & Neelsen, 2019).

The World Health Organization (WHO) recommends a target of at least 5% of GDP for government health expenditure to make meaningful progress toward UHC, emphasizing the importance of adequate funding (McIntyre et al., 2017). The service coverage index (SCI) significantly correlated with socioeconomic factors like GDP and health expenditure, highlighting the crucial role of economic resources in achieving UHC. Overall, increased health expenditure as a percentage of GDP is a powerful driver of improved UHC outcomes, enhancing both service coverage and financial protection across diverse contexts (Takura & Miura, 2022).

The following formulation of the hypothesis is possible based on the studies mentioned above:
H4: Health Expenditure as a percentage of GDP is positively associated with Universal Health Coverage

RESEARCH METHODOLOGY

This study adopts a quantitative cross-sectional research approach, utilizing various indexes as both independent and dependent variables. The methodology employed aims to investigate relationships within the context of the research objectives. The analysis to examine associations between sustainability-related predictors and UHC outcomes.

Research Variables
The variables to be used are as follows:

- **Dependent variable**

Universal health coverage index (WHO, 2021).

- **Independent variables**

1. Social sustainability (Human wellbeing component of SSI) (https://ssi.wi.th-koeln.de, 2023).
2. Environmental sustainability (Environmental wellbeing component of SSI) (https://ssi.wi.th-koeln.de, 2023).
3. Economic sustainability (Economic wellbeing component of SSI) (https://ssi.wi.th-koeln.de, 2023).
4. Political stability index (World Bank, 2023).
5. Government effectiveness index (World Bank, 2023).
6. Health expenditure as a percentage of GDP (World Bank, 2023)

Table 1: Research Variables and Source Year

Variable	Index/Source	Year of Data
Dependent Variable		
Universal Health Coverage Index	World Health Organization (WHO)	2023
Independent Variables		
Social Sustainability (Human wellbeing)	Sustainable Society Index (SSI)	2023
Environmental Sustainability (Environmental wellbeing)	Sustainable Society Index (SSI)	2023
Economic Sustainability (Economic wellbeing)	Sustainable Society Index (SSI)	2023
Political Stability Index	World Bank Worldwide Governance Indicators (WGI)	2023
Government Effectiveness Index	World Bank Worldwide Governance Indicators (WGI)	2023
Health Expenditure (% of GDP)	World Bank World Development Indicators (WDI)	2023

Population & Sampling

The target population refers to the group of individuals, entities, or units on which the research aims to focus. It is essential to clearly define the characteristics of the target population and any relevant subgroups within it. A sampling technique is a systematic procedure used to select a subset, or sample, from the larger population for study and analysis purposes.

For this study, the target population initially consisted of 194 countries with available international indices and indicators relevant to the study variables. A comprehensive population (census-based) approach was adopted to provide a holistic overview of global healthcare systems and to examine the factors influencing the implementation of Universal Health Coverage (UHC) across countries worldwide.

By including all countries with accessible data, the study aimed to capture a broad and representative understanding of the relationships between the independent and dependent variables at the international level. This approach supports the analysis of variations among countries and provides insights that may contribute to healthcare policy and practice globally.

However, during the data collection and screening process, 28 countries were excluded due to incomplete or unavailable data for one or more of the study variables. Missing data were identified across the databases used for measuring the independent, dependent, and control variables, which could affect the validity and reliability of the statistical analysis.

Accordingly, the final sample consisted of 166 countries with complete datasets suitable for statistical analysis. Therefore, the sampling technique can be described as a purposive census-based sampling approach, where all eligible countries with complete data availability were included in the study.

The inclusion criteria were:

- Availability of complete data for all study variables.
- Inclusion within the international databases and indices adopted in the study period.

The exclusion criteria were:

- Countries with missing or incomplete data for any of the study variables.
- Countries lacking consistent or comparable measurements across the selected indicators.

The final sample size of 166 countries was considered adequate to perform the required statistical analyses and to ensure sufficient representation of countries across different economic and geographic regions.

Table 1 shows the distribution of the target population in regions all over the world.

Table 2: Target Population in Regions

Region	Frequency	Percentage
Africa	53	27%
Asia	47	24%
Europe	43	22%
North America	23	12%
Oceania	16	8%
South America	12	6%
Total	194	100%

Data Collection Procedures

The data relies on secondary data obtained from reputable organizations such as the World Bank, World Health Organization, or UNICEF. Given the inadequate functioning of data infrastructure, particularly in low- and middle-income countries, relying on established third-party sources ensures the reliability and validity of the data. The data utilized is predominantly from the year 2021, representing the most recent and comprehensive information available across all relevant indices. The cross-sectional study design enables simultaneous assessment of the impact of independent variables on dependent variables, allowing for the measurement of their significance and potential relationships.

To strengthen methodological rigour, regression diagnostics will be performed, including checks for multicollinearity (Variance Inflation Factor), residual normality, and heteroscedasticity. These tests will enhance confidence in the robustness of the statistical results.

Ethical considerations are also taken into account: although the study relies solely on publicly available secondary data, proper citation of sources and acknowledgment of the limitations of composite indices (such as SSI), which may mask subnational variation, are ensured.

Data Analysis

The proposed approach is to empirically examine statistical associations (rather than causal links). The analysis is conducted utilizing secondary data from the entire population of 194 countries, with publicly available indices that accurately represent all countries. Analysis of recorded data is conducted using the statistical software for social sciences, namely SPSS 23

Correlation Analysis

Table (3) shows a statistically significant positive correlation between the universal health coverage index and social sustainability, economic sustainability, environmental sustainability, government effectiveness index, political stability index, and health expenditure as % of GDP, with a p-value ($p < 0.05$). The correlation is strong with social sustainability and economic sustainability with r – value ($r < 0.7$), moderate with environmental sustainability and government effectiveness with r-value ($0.7 \geq r \geq 0.3$), and weak with political stability and health expenditure as % of GDP with r – value ($r < 0.3$).

Table (3) Correlation between universal health coverage indexes and different items.

	Universal health coverage index		
	r-value	p-value	Sig.
Social sustainability	0.866	0.000	HS
Economic sustainability	0.893	0.000	HS
Environmental sustainability	0.638	0.000	HS
Government effectiveness index	0.528	0.000	HS
Political stability index	0.215	0.003	HS
Health expenditure as % of GDP	0.299	0.000	HS

Using: Pearson's correlation coefficient (r)
NS: Non significant; S: Significant; HS: Highly significant

Testing Research Hypotheses

Hypothesis 1 (H1): Sustainable Society Index (SSI) is positively and significantly associated with Universal Health Coverage (UHC).

To test the 1st main hypothesis, secondary hypothesizes testes by conducting linear regression analysis, and the test results revealed the following:

Hypothesis 1 (H1.a): Social sustainability index (SoSI) is positively and significantly associated with Universal Health Coverage (UHC).

Table (4): Summary of Linear Regression for the effect of social sustainability index (SoSI) on universal health coverage index (UHC).

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R^2	Adj. R^2	F	Sig.
	□	SE	Beta							
(Constant)	27.911	1.785		15.633	0.000	0.866	0.750	0.749	493.125	0.000
Social Sustainability Index	0.576	0.026	0.866	22.206	0.000					

β: Regression coefficient, SE: Standard error
R^2: impact factor
28 countries do not have results available for the Social Sustainability.
Also, 2 countries do not have results available for the universal health coverage index.
As mentioned in Table (4) social sustainability index (SoSI) has a direct, strong significant, and positive impact on the universal health coverage index (UHC) (B=0.576, p-value<0.05), which reveals the acceptance of the 1st secondary hypothesis. On the other hand, the R-squared is 0.750, which means that the social sustainability index (SoSI) explains 75% of the variation in the universal health coverage index (UHC), which is considered a strong effect. The regression equation can be presented as follows:

UHC = 27.911 + (0.576) SoSI

As mentioned in the above equation, if the social sustainability index increases by one unit, the universal health coverage will increase by 0.576

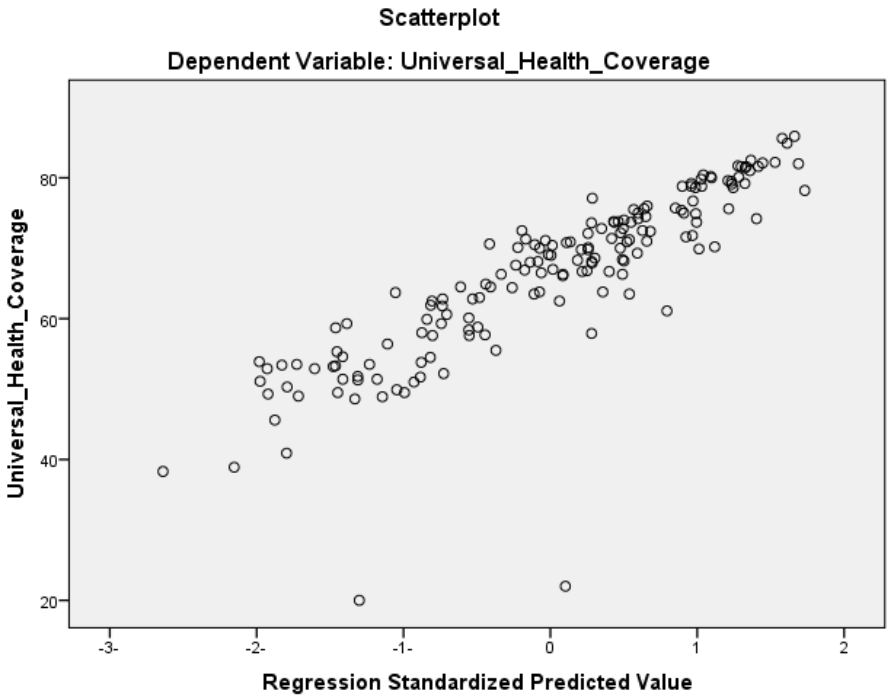

Figure (4) Scatterplot showing the relationship between UHC and Social Sustainability

Source: Prepared by the researcher using IBM SPSS Statistics

Figure (4) reveals that, the scatterplot demonstrates a strong positive relationship between Universal Health Coverage (UHC) and social sustainability. The data points generally follow an upward trend, indicating that countries with higher levels of social sustainability tend to achieve higher UHC index scores.

Hypothesis 1 (H1.b): Economic sustainability index (EcSI) is positively and significantly associated with universal health coverage (UHC).

Table (5) : Summary of Linear Regression for the effect of the economic sustainability index (EcSI) on the universal health coverage index (UHC).

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R^2	Adj. R^2	F	Sig.
	□	SE	Beta							
(Constant)	22.685	1.765		12.855	0.000	0.893	0.797	0.796	644.316	0.000
Economic Sustainability Index	0.668	0.026	0.893	25.383	0.000					

β: Regression coefficient, SE: Standard error

R2: impact factor

28 countries do not have results available for the economic sustainability

Also, 2 countries do not have results available for the universal health coverage index.

As mentioned in Table (5) economic sustainability index (EcSI) has a direct, strong significant, and positive impact on the universal health coverage index (UHC) (B=0.668, p-value<0.05), which reveals the acceptance of the 2nd secondary hypothesis. On the other hand, the R-squared is 0.797, which means that the economic sustainability index (EcSI) explains 79.7% of the variation in the universal health coverage index (UHC), which is considered a strong effect. The regression equation can be presented as follows:

UHC = 22.685 + (0.668) EcSI

As mentioned in the above equation, if the economic sustainability index increases by one unit, the universal health coverage will increase by 0.668

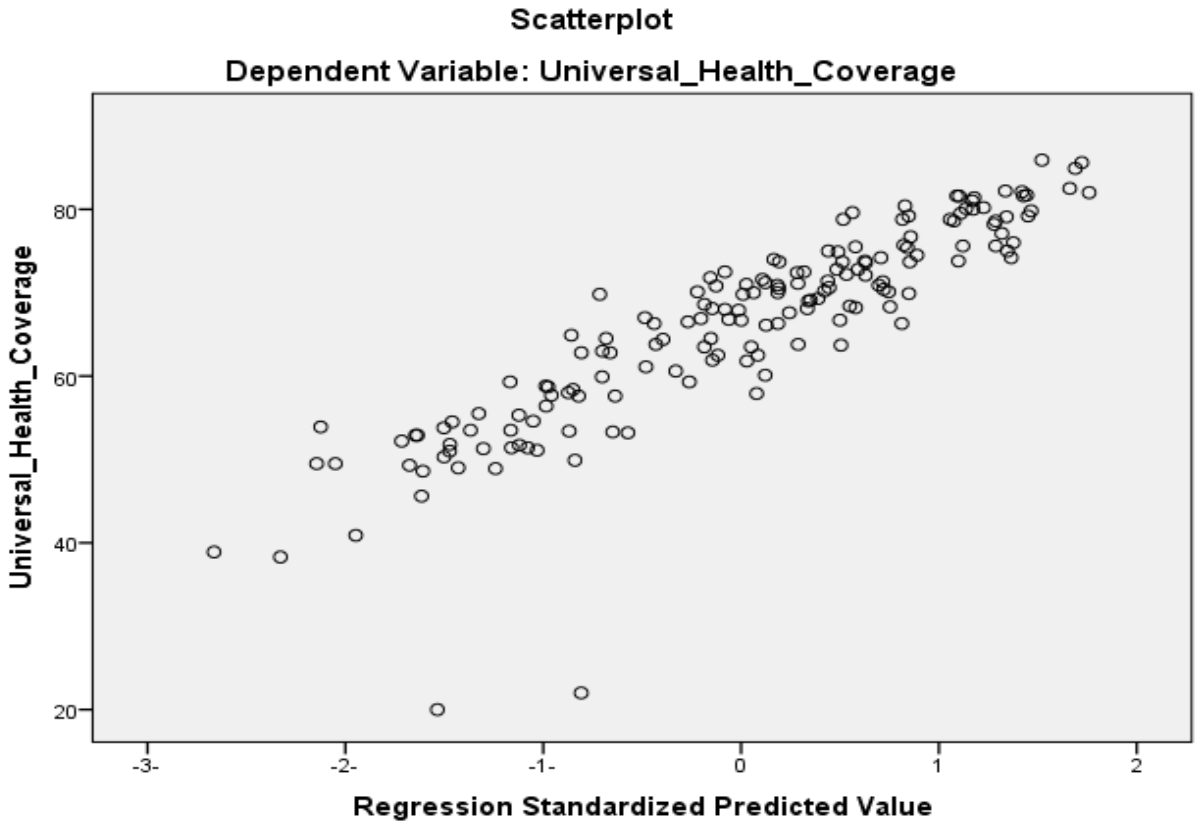

Figure (5) Scatterplot showing the relationship between UHC and Economic Sustainability

Source: Prepared by the researcher using IBM SPSS Statistics

Figure (5) represents that, the scatterplot reveals a strong positive relationship between Universal Health Coverage (UHC) and economic sustainability. The upward pattern of the data points indicates that countries with higher levels of economic sustainability tend to report higher UHC index scores.

Hypothesis 1 (H1.c): Environmental sustainability index (EnSI) is positively and significantly associated with universal health coverage (UHC).

Table (6) : Summary of Linear Regression for the effect of Environmental Sustainability Index (EnSI) on Universal Health Coverage Index (UHC).

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R^2	Adj. R^2	F	Sig.
	□	SE	Beta							
(Constant)	-13.712	7.577		-1.810	0.072	0.638	0.407	0.403	112.366	0.000
Environmental Sustainability Index	1.153	0.109	0.638	10.600	0.000					

β: Regression coefficient, SE: Standard error

R2: impact factor

28 countries do not have results available for the economic sustainability

Also, 2 countries do not have results available for the universal health coverage index.

As mentioned in Table (6), the environmental sustainability index (EnSI) has a direct, significant, and positive impact on the universal health coverage index (UHC) (B=1.153, p-value<0.05), which reveals the acceptance of the 3rd secondary hypothesis. On the other hand, the R-squared is 0.407, which means that the environmental sustainability index (EnSI) explains 40.7% of the variation in the universal health coverage index (UHC), which is considered a moderate effect. The regression equation can be presented as follows:

UHC = -13.712 + (1.153) EnSI

As mentioned in the above equation, if the environmental sustainability index increases by one unit, the universal health coverage will increase by 1.153

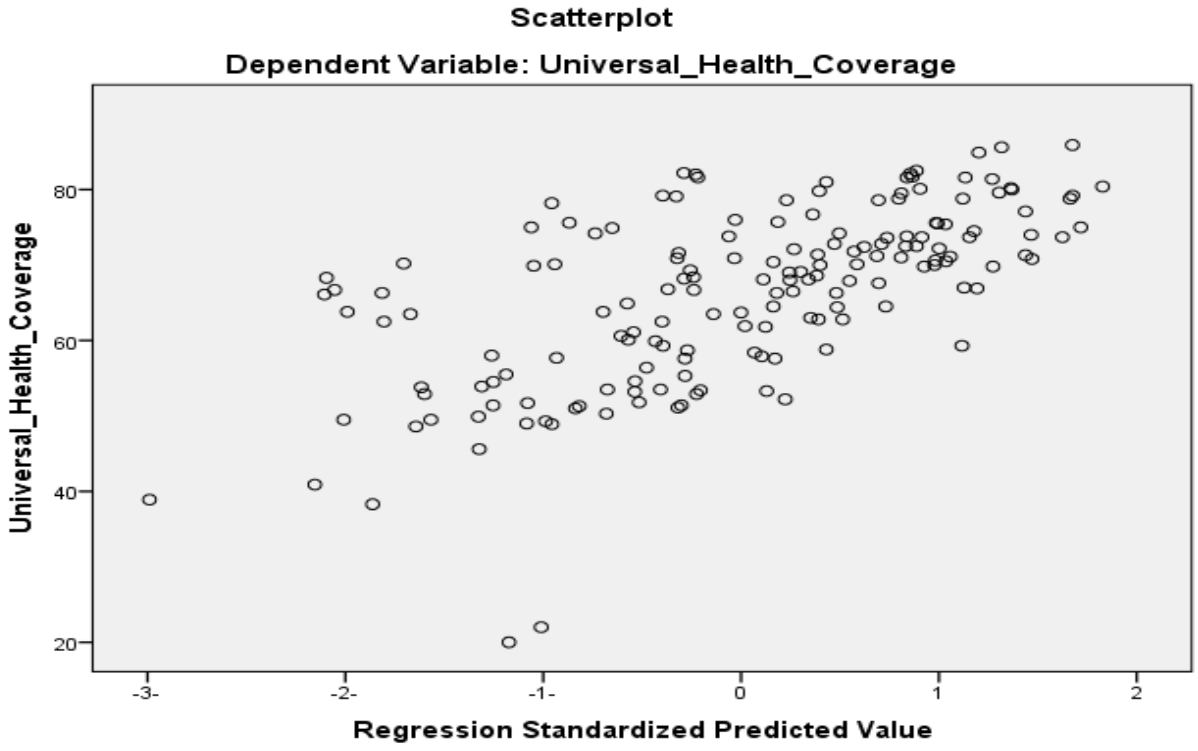

Figure (6) Scatterplot showing the relationship between UHC and Environmental Sustainability

Source: Prepared by the researcher using IBM SPSS Statistics

Figure (6) represents that, the scatterplot indicates a moderate positive relationship between Universal Health Coverage (UHC) and environmental sustainability. The data points show an overall upward trend, suggesting that countries with higher levels of environmental sustainability generally tend to achieve better UHC outcomes. However, compared with a strong relationship, the observations are more widely dispersed around the trend line, indicating that the association is moderate rather than highly consistent.

Hypothesis 2 (H2): Government effectiveness index (GEI) is positively and significantly associated with universal health coverage (UHC).

Table (7): Summary of Linear Regression for the effect of the Government Effectiveness Index (GEI) on the Universal Health Coverage Index (UHC).

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R^2	Adj. R^2	F	Sig.
	□	SE	Beta							
(Constant)	62.972	0.954		66.000	0.000	0.528	0.279	0.275	73.537	0.000
Government effectiveness index	8.234	0.960	0.528	8.575	0.000					

β: Regression coefficient, SE: Standard error
R^2: impact factor
28 countries do not have results available for the economic sustainability
Also, 2 countries do not have results available for the universal health coverage index.

As mentioned in Table (7) Government Effectiveness Index (GEI) has a direct, positive, and significant impact on the Universal Health Coverage Index (UHC) (B=8.234, p-value<0.05), which reveals the acceptance of the hypothesis. On the other hand, the R-squared is 0.279, which means that the government effectiveness index (GEI) explains 27.9% of the variation in the universal health coverage index (UHC), which is considered a moderate effect. The regression equation can be presented as follows:

UHC = 62.972 + (8.234) GEI

As mentioned in the above equation, if the government effectiveness index increased by one unit, the universal health coverage would increase by 8.234

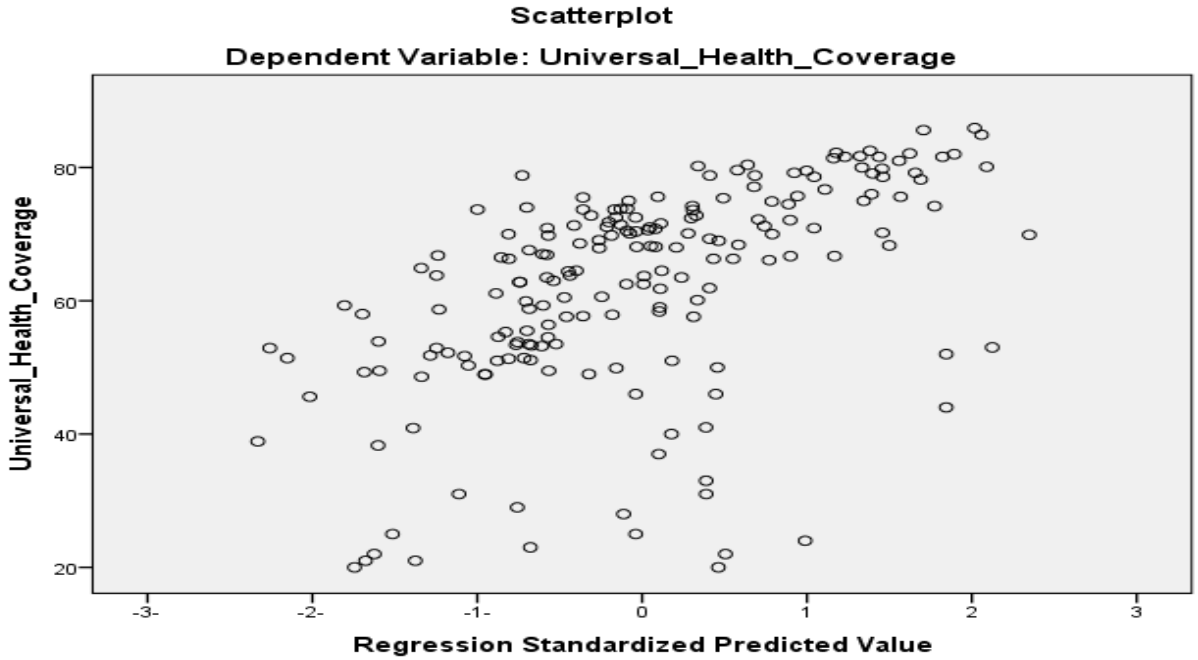

Figure (7) Scatterplot showing the relationship between UHC and Government effectiveness

Source: Prepared by the researcher using IBM SPSS Statistics

Figure (7) represents that, the scatterplot demonstrates a moderate positive relationship between Universal Health Coverage (UHC) and government effectiveness. The general upward trend of the data points indicates that countries with higher levels of government effectiveness tend to achieve higher UHC index scores. However, the data points are moderately scattered around the trend line, indicating that the relationship is positive but not strongly consistent across all observations.

Hypothesis 3 (H3): Political stability index (PSI) is positively and significantly associated with universal health coverage (UHC).

Table (8): Summary of Linear Regression for the effect of political stability index (PSI) on universal health coverage index (UHC).

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R^2	Adj. R^2	F	Sig.
	□	SE	Beta							
(Constant)	62.600	1.098		57.007	0.000	0.215	0.046	0.041	9.236	0.003
Political stability index (2021)	3.398	1.118	0.215	3.039	0.003					

β: Regression coefficient, SE: Standard error
R^2: impact factor
28 countries do not have results available for the economic sustainability
Also, 2 countries do not have results available for the universal health coverage index.

As mentioned in Table (8) political stability index (PSI) has a direct, significant impact on the universal health coverage index (UHC) (B=3.398, p-value<0.05), which reveals the acceptance of the hypothesis. On the other hand, the R-squared is 0.046, which means that the political stability index (PSI) explains 4.6% of the variation in the universal health coverage index (UHC), which is considered a weak effect. The regression equation can be presented as follows:

UHC = 62.600+ (3.398) PSI

As mentioned in the above equation, if the political stability index increases by one unit, the universal health coverage will increase by 3.398

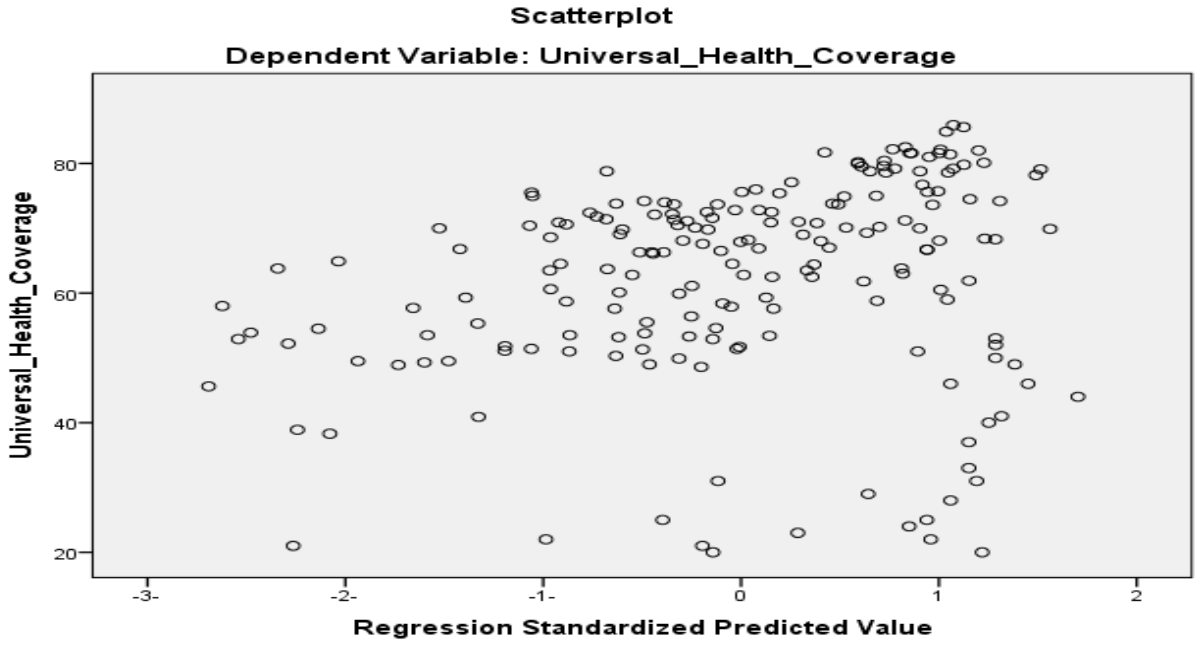

Figure (8) Scatterplot showing the relationship between UHC and Political stability

Source: Prepared by the researcher using IBM SPSS Statistics

Figure (8) represents that, the scatterplot reveals a weak positive relationship between Universal Health Coverage (UHC) and political stability. The data points show a slight upward trend, suggesting that countries with higher levels of political stability may tend to achieve somewhat higher UHC index scores. However, the observations are widely dispersed around the trend line, indicating that the relationship is weak and less consistent compared to other variables.

Hypothesis 4 (H4): Health expenditure as % of GDP is positively and significantly associated with universal health coverage (UHC).

Table (9) : Summary of Linear Regression for the Health expenditure as % of GDP on universal health coverage index (UHC).

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R^2	Adj. R^2	F	Sig.
	□	SE	Beta							
(Constant)	53.061	2.388		22.224	0.000	0.299	0.090	0.085	18.718	0.000
Health expenditure as % of GPD (2020-2021)	1.346	0.311	0.299	4.326	0.000					

β: Regression coefficient, SE: Standard error
R^2: impact factor
28 countries do not have results available for the economic sustainability
Also, 2 countries do not have results available for the universal health coverage index.

As mentioned in Table (9), health expenditure as % of GDP has a direct, significant impact on the universal health coverage index (UHC) (B=1.346, p-value<0.05), which reveals the acceptance of the hypothesis. On the other hand, the R-squared is 0.090, which means that health expenditure as % of GDP explains 9.0% of the variation in the universal health coverage index (UHC), which is considered a weak effect. The regression equation can be presented as follows:

UHC = 53.061+ (1.346) HE

As mentioned in the above equation, if the health expenditure as % of GDP increased by one unit, the universal health coverage would increase by 1.346

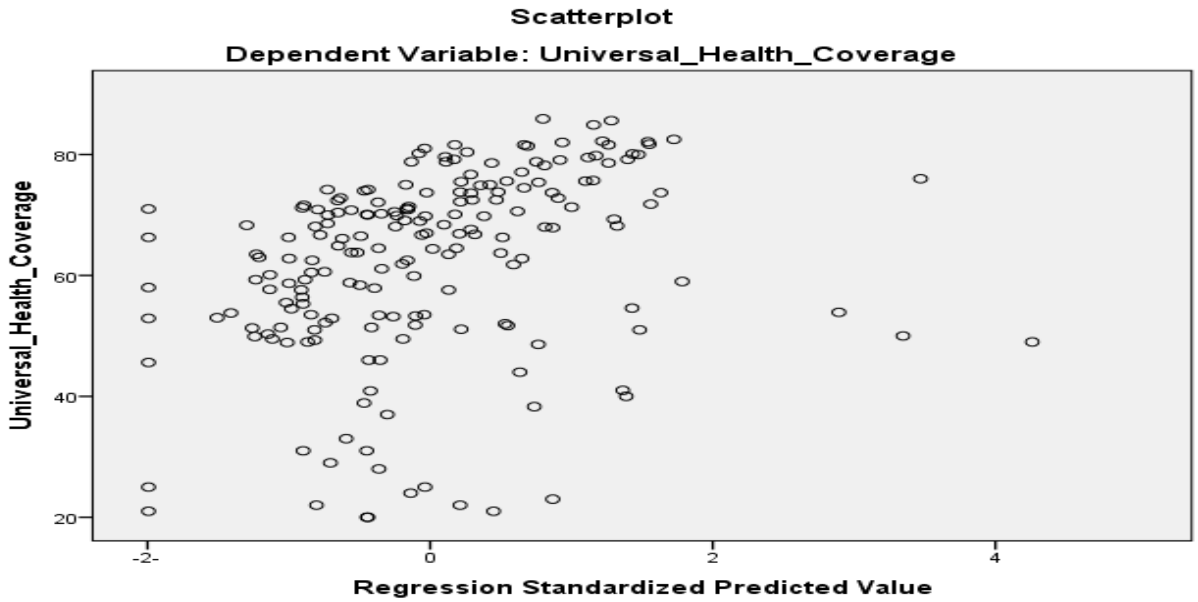

Figure (9) Scatterplot showing the relationship between UHC and Health Expenditure as a percentage of GDP

Source: Prepared by the researcher using IBM SPSS Statistics

Figure (9) represents that, the scatterplot indicates a weak positive relationship between Universal Health Coverage (UHC) and health expenditure as a percentage of GDP. The data points display a slight upward trend, suggesting that countries allocating a higher proportion of their GDP to health expenditure tend to achieve somewhat better UHC index scores. However, the wide dispersion of observations around the trend line demonstrates that the relationship is weak and not highly consistent across countries.

5.4 Multiple Regression Analysis

The study employed multiple linear regression analysis to examine the effect of the independent variables on the dependent variable, Universal Health Coverage (UHC). Multiple regression analysis was considered appropriate because it enables the assessment of the combined and individual contributions of several predictor variables in explaining variations in the dependent variable. The analysis was conducted to determine the strength, direction, and statistical significance of the relationships between the independent variables and UHC, while controlling for the influence of the other variables included in the model. Prior to conducting the regression analysis, the assumptions of multiple regression, including normality, linearity, multicollinearity, and homoscedasticity, were assessed to ensure the suitability of the data for the analysis.

Table (10) : Multivariate linear regression analysis between the independent variable and the dependent "Universal Health Coverage Index ".

Model	Independent Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R^2	Adj. R^2	F-test	p-value
		B	SE	Beta							
Model 1	(Constant)	22.685	1.765		12.855	0.000	0.893	0.797	0.796	644.316	0.001
	Economic sustainability index	0.668	0.026	0.893	25.383	0.000					
Model 2	(Constant)	11.319	1.756		6.447	0.000	0.937	0.878	0.876	586.007	0.001
	Economic sustainability index	0.411	0.032	0.549	12.796	0.000					
	Social sustainability index	0.427	0.041	0.446	10.386	0.000					
Model 3	(Constant)	-6.062	3.175		-1.909	0.058	0.950	0.902	0.900	496.894	0.001
	Economic sustainability index	0.363	0.030	0.485	12.160	0.000					
	Social sustainability index	0.387	0.037	0.404	10.319	0.000					
	Environmental sustainability index	0.334	0.053	0.185	6.308	0.000					

β: Regression coefficient, SE: Standard error
R: Regression value

Table (10) presents Multivariate linear regression analysis revealed that the Economic Sustainability Index, Social Sustainability Index, and Environmental Sustainability Index are highly significant predictors of change in the

Universal Health Coverage Index, with a p-value ($p<0.001$); while the Government Effectiveness Index, Political Stability Index, and Health expenditure as % of GDP have insignificant regression

Results and Findings

The first research hypotheses is to examine the effect of social sustainability index on universal health coverage (UHC).

H1.a Social Sustainability Index (SoSI) has a significant positive effect on Universal Health Coverage (UHC).

The hypothesis is accepted. The regression results indicate that Social Sustainability Index has a strong and statistically significant positive effect on UHC ($B = 0.576$, $SE = 0.026$, $\beta = 0.866$, $t = 22.206$, $p < 0.001$). The model explains 75% of the variance in UHC ($R^2 = 0.750$), highlighting the substantial contribution of social sustainability to healthcare accessibility and financial protection. Importantly, this association should not be interpreted as causal, but rather as evidence of a strong statistical relationship.

This result is in line with NG & Fong (2022) study which reveals that social sustainability is crucial for equitable healthcare access in universal coverage. Ensures financial risk protection for all individuals in healthcare systems, and Khan et al. (2019) pointed that countries characterized by high poverty rates and substantial informal economies sometimes face challenges in generating sufficient tax revenues. This impedes the allocation of proper funds towards healthcare services and restricts the accessibility of care, thereby diminishing the UHC index. The analysis of UHC indices reveals that individuals from higher socioeconomic strata make a greater contribution to the index, hence emphasizing the existing inequalities in healthcare accessibility (MV et al., 2022).

H1.b Economic Sustainability Index (EcSI) has a significant positive effect on Universal Health Coverage (UHC).

The hypothesis is accepted. The regression results demonstrate that ESI exerts a very strong and statistically significant positive effect on UHC ($B = 0.668$, $SE = 0.026$, $\beta = 0.893$, $t = 25.383$, $p < 0.001$). The model explains nearly 80% of the variance in UHC ($R^2 = 0.797$), confirming that economic sustainability is a highly significant predictor of healthcare accessibility and effectiveness. This association underscores the theoretical expectation that stronger economic foundations enable health systems to expand service provision and financial protection.

The findings of the study reveal that economic sustainability is a key factor and serves as a very highly significant predictor of change in the universal health coverage index. This highlights the fundamental importance of economic factors in shaping and influencing the effectiveness and accessibility of healthcare services for a population. This result is agreed with Alexander et al. (2021) which had focused on universal healthcare coverage in middle-income countries such as Mexico, Turkey, The Republic of Korea, and Ukraine. The result also is in line with (Nundoochan, 2023) & (MV et al., 2022).

H1.c Environmental Sustainability Index (EnSI) has a moderate positive effect on Universal Health Coverage (UHC).The hypothesis is accepted. Regression results indicate that EnSI has a statistically significant positive effect on UHC ($B = 1.153$, $SE = 0.109$, $\beta = 0.638$, $t = 10.600$, $p < 0.001$). The model explains about 41% of the variance in UHC ($R^2 = 0.407$), suggesting that environmental sustainability contributes meaningfully, though moderately, to healthcare system performance and coverage outcomes. This supports the theoretical argument that environmental determinants—such as air quality, water quality, and climate resilience—are indirect but important enablers of equitable healthcare systems.

Therefore, the results suggest that several elements influencing environmental sustainability, including air quality, water quality, energy sources, and climate conditions, might have a substantial influence on the sustainability and efficacy of universal health coverage programs.

This result agreed with Putnis & Neilson (2022) argue that environmental sustainability has a substantial effect on the Universal Health Coverage (UHC) index by impacting multiple factors that determine health and the delivery of healthcare. Health systems are significant contributors to pollution, accounting for around 4.6% of worldwide emissions. The environmental implications can be either reduced or worsened depending on the approach adopted to improve the quality of care. The correlation between human health and environmental health is apparent, as environmental deterioration results in heightened rates of mortality and morbidity caused by factors including air and water pollution, which are accountable for approximately 13 million fatalities each year (The Lancet, 2022).

H2 Government Effectiveness Index has a moderate positive effect on universal health coverage (UHC).

The hypothesis is accepted. Regression results demonstrate that GEI significantly predicts UHC ($B = 8.234$, $SE = 0.960$, $\beta = 0.528$, $t = 8.575$, $p < 0.001$). The model explains about 28% of the variance in UHC ($R^2 = 0.279$), indicating a moderate effect size. This highlights the vital role of effective governance in shaping healthcare policy outcomes and ensuring the sustainability of UHC initiatives.

This finding reinforces institutional theory, which posits that effective governance is a prerequisite for implementing sustainable health policies. According to

Kanang et al. (2020), they confirm that sustaining universal health coverage requires robust active public participation in policy formation and governance. This finding underscores the essential link between effective governance, public engagement, and the long-term success of healthcare policies and programs aimed at achieving universal health coverage. Also, the recent result is in line with (Ng et al., 2014) & (Fadlli et al., 2019) & (Prabowo et al., 2021).

H3 Political stability index has a weak positive effect on Universal Health Coverage (UHC)

The hypothesis is accepted. Regression results show that PSI significantly predicts UHC (B = 3.398, SE = 1.118, $\beta = 0.215$, $t = 3.039$, $p < 0.001$). However, the model explains only about 5% of the variance in UHC ($R^2 = 0.046$), indicating a weak effect size. This suggests that while political stability plays a role in shaping healthcare outcomes, its overall contribution to UHC is relatively limited compared to social and economic sustainability factors.

Alexander et al. (2021) study focus on Universal Health Coverage (UHC) in four of the middle-income countries, – Mexico, Turkey, The Republic of Korea and Ukraine. The results agree that reaching UHC is an achievable and attainable goal in middle-income countries and that the successes of UHC are related to a great extent to political stability. The result is agreed with Wehrmeister (2017) who conducted a study that demonstrated a positive association between levels and equity in reproductive, maternal, newborn, and child health (RMNCH) interventions with political stability and the absence of violence, along with GDP. This indicates the far-reaching impact of political stability on healthcare outcomes and access. Additionally, Berman (2019) explored governance and organizational change within ministries of health (MOH) and identified four mechanisms that MOH can utilize to drive organizational change. These mechanisms include establishing high-level interministerial teams, creating MOH change teams, securing systemic change components through legislation, and leveraging political change windows for health reforms. While these mechanisms are crucial for organizational change within healthcare systems, their direct impact on universal health coverage and its long-term sustainability is not measured in the study.

H4 Health expenditure as a percentage of Gross domestic product has a weak positive effect on universal health coverage (UHC)

The hypothesis is accepted. Regression results indicate that health expenditure as a share of GDP significantly predicts UHC (B = 1.346, SE = 0.311, $\beta = 0.299$, $t = 4.326$, $p < 0.001$). However, the explanatory power is limited, with the model accounting for only about 9% of the variance in UHC ($R^2 = 0.090$). This suggests that while greater financial investment in health systems contributes to expanding UHC, the effect size is relatively weak compared to social and economic sustainability. This suggests that increased spending does not automatically guarantee improved UHC outcomes, and efficiency of allocation remains critical.

The result is in line with Vincent & Okungu's (2019 highlights the significant role of diverse financial sources, including informal sector contributions, in supporting and sustaining universal health coverage efforts.

Furthermore, Huang and Yoshino's (2016) confirm the impact of tax-financed universal health coverage schemes on various macroeconomic aspects such as labor supply, asset holding, inequality, and overall welfare. This underscores the broader economic implications and benefits of implementing robust healthcare financing mechanisms, particularly through tax-funded approaches, in supporting universal health coverage goals..

Research Implication

The theoretical implications

- The research emphasizes the critical role of political commitment and stability in achieving Universal Health Coverage (UHC) in low- and middle-income countries, highlighting the need for good governance and demographic balance to meet UHC goals by 2030.
- The research highlights the complex interplay between political, economic, and governance factors in determining the success of UHC initiatives, underscoring the importance of addressing structural factors such as governance, stability, and demographic balance to ensure UHC implementation and sustainability.
- However, as the study employs a cross-sectional design, it is important to note that causal relationships cannot be firmly established.

The practical implications

- This study aims to assist policymakers in identifying the determinants that impact the long-term viability of universal health coverage (UHC) in order to facilitate its effective implementation. This would guarantee that every individual has fair and reasonably priced access to efficient healthcare services, without leaving anyone behind, while also ensuring that utilizing these services does not result in financial difficulties for the user. UHC's performance and sustainability enhance the coordination and support of countries in achieving the health targets of the 2030 Sustainable Development Goals (SDGs).
- This study aims to assist policy makers in achieving universal health coverage (UHC), which entails ensuring that all individuals have access to necessary health services. These services encompass measures to enhance overall health, prevent diseases, and deliver effective treatment,

rehabilitation, and palliative care. Additionally, it is crucial to ensure that the utilization of these services does not result in financial burdens for the users.

- It is crucial to monitor the Universal Health Coverage (UHC) index in different countries and analyze the impact of various factors on UHC. This is necessary to guarantee fair and affordable access to high-quality health care for all individuals. UHC's performance and sustainability enhance the coordination and support of countries in achieving the health targets set for the 2030 Sustainable Development Goals (SDGs). Nevertheless, the regression results showed modest explanatory power (e.g., political stability and health expenditure explained relatively small proportions of UHC variance), suggesting that not all determinants exert equally strong predictive effects

Limitations of the study

- The study encounters several limitations that should be considered when interpreting the findings. The limitations include:
- The analysis is based on composite indices (e.g., Universal Health Coverage, social sustainability, environmental sustainability), which are constructed from multiple underlying indicators and KPIs. While these indices provide a comprehensive and standardized measure of complex multidimensional constructs, they may mask variations among individual components and introduce aggregation bias.
- The study excluded 28 countries due to missing or incomplete data. Although this exclusion was necessary to ensure the consistency and validity of the regression analysis, it may introduce selection bias and limit the generalizability of the findings to the full population of countries.
- The presence of moderate multicollinearity among some independent variables, particularly social sustainability, economic sustainability, and government effectiveness, which may affect the stability and precision of the regression coefficients.
- Despite these limitations, the study provides valuable insights into the relationship between sustainability dimensions, governance factors, and progress toward Universal Health Coverage.

CONCLUSION

Universal health coverage (UHC) is a crucial objective for nations globally, seeking to guarantee that every person has access to high-quality healthcare services without experiencing financial restrictions. A multitude of elements that intersect across environmental, social, and economic spectrums, as well as political and governance considerations, shape the attainment of universal health coverage (UHC). This study's findings highlight that social and economic sustainability exert the strongest associations with UHC, while governance effectiveness, political stability, and health expenditure show more moderate or weak effects. These results reinforce the theoretical argument that progress toward UHC cannot be achieved through financial investment or institutional reforms alone, but requires a balanced integration of sustainability, governance, and equity dimensions.

At the same time, the cross-sectional design limits causal inference, meaning the results should be interpreted as associations rather than definitive cause–effect relationships. Future research employing longitudinal or mixed-method approaches is essential to validate these findings and uncover the dynamic pathways linking sustainability, governance, and UHC performance across countries.

Suggestions for Future Research Directions

Opportunities of other research that explores the interplay between universal health coverage (UHC) and various factors, including environmental sustainability, social sustainability, economic sustainability, political stability, government effectiveness, and health expenditure as a percentage of Gross Domestic Product (GDP):

- Evaluate the potential synergies between environmental sustainability measures (e.g., renewable energy use in healthcare facilities, waste management practices) and improvements in health service delivery under UHC frameworks.
- Analyze how social determinants of health (e.g., education, income inequality, social inclusion) influence access to healthcare services and health outcomes under UHC policies.
- Assess the long-term economic implications of implementing UHC, including cost-effectiveness analyses, financial sustainability models, and impact on national budgets and fiscal policies.
- Study the role of political stability and effective governance in driving successful UHC implementation, including policy continuity, stakeholder engagement, and regulatory frameworks.
- Explore the relationship between health expenditure levels, resource allocation strategies, and access to quality healthcare services under UHC systems.
- Develop frameworks or guidelines for integrating environmental, social, and economic sustainability principles into UHC policies and programs.

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