Health Outcomes and Health Expenditure. A Cross-Sectional Study in Kenya

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ABSTRACT

Health economics has made it possible to prioritize health expenditure given different levels of income. Most studies focus on mortality as a health outcome. Quality of life and life expectancy are an equally important outcome. High-income earners have good management of hypertension due to health insurance coverage. Two-thirds of middle and low-income countries are affected by hypertension. The study on high blood pressure is anchored on the Grossman model and the human capital theory. This is hypertension is a chronic disease that reduces the stock of health. Its detection and management is crucial for quality of life. This study diverges into high blood pressure as a health outcome. Independent variables are high blood pressure of women, health outcomes, employment of women, level of education of women, public health insurance coverage, private health insurance coverage, any insurance, and mental health. The main objective is to determine the effect of insurance education, obesity, and distance to the nearest facility on high blood pressure health outcomes. The first minor objective is to evaluate how public health insurance coverage affects access to high blood pressure diagnosis and treatment. The second objective seeks to evaluate how a lack of basic education affects access to high blood pressure diagnosis and treatment. It uses secondary cross-sectional data from KNBS. The Cobb-Douglas model is suitable for analyzing DHS data in STRATA. The findings show that only public health insurance expenditure has a significant impact on high blood pressure management. In this regard, we do not reject the first objective. The government of Kenya should therefore prioritize social health insurance for proper management of diabetes.

Keywords: Cobb-Douglas Health outcome Health expenditure Hypertension High blood pressure Kenya Cross-sectional insurance

INTRODUCTION

This document is a template Health economics addresses different health outcomes. One of the most significant health outcomes is high blood pressure. The condition is also called hypertension (HBP). It is a critical condition that increases the risk of stroke, heart disease, and other health complications. Four factors stand out as key determinants of HBP: educational attainment, insurance, distance to the nearest health facility, and obesity. The study by Okuom, Obange, & Scholastica (2023) demonstrates how increasing per capita income increases youth employment and thus positively affects access to education, health insurance, health, and healthcare services.

Hypertension affects nearly 2/3 of people living in middle-income and low-income countries (WHO, 2019). 1.13 billion People are affected globally. People in high-income countries have better management of high blood pressure because of large insurance coverage, which gives them better management of their condition. However, those in middle-income and low-income countries are highly affected by HBP because of their limited access to Healthcare, lower educational attainment in such, and high obesity rates. It is therefore evidence that the socioeconomic background of developed countries are different from those of the developing countries and must be factored in studies relating to HBP. A global action plan is an initiative by WHO to prevent non-communicable diseases and reduce hypertension. The strategies that WHO uses are improving access to healthcare and basic public education campaigns and coming up with policies that promote healthier lifestyles.

Sedentary lifestyle, imagine dietary habits; and rapid urbanization have accelerated the spread of hypertension, making it a public health concern. The prevalence of hypertension is higher in rural areas than in urban given a range of 15 to 30% services (Ataklte et al., 2015). Africa is generally affected by factors such as inadequate health infrastructure, weak health systems, and insufficient funding of healthcare.

Many Africans rely on out-of-pocket health expenditures that are very expensive. Given the high cost of education, there are many people who have limited information and knowledge on health management. Low levels of education have a high correlation with poor health literacy and poor health outcomes. The rising cases of obesity in rural areas are less than those of urban areas and contribute immensely to increasing the burden of hypertension as a disease.

There is a high burden of hypertension in sub-Saharan because it has some of the poorest nations in the world. That translates to an increase health disparities. 30% of the population is affected by hypertension (Adeloye et al., 2015). Adoption of Western dietary patterns has resulted to an increase in obesity rates in Africa. The same is amplified by urbanization in Africa. However, the main concern is the high poverty rate that limits access to healthcare facilities and treatment.

Tanzania, Uganda, and Kenya are highly affected by infections and non-communicable diseases. Hypertension is one of them. It is increasing at a rate above 15% (Ojji et al., 2018). The high increase in hypertensive prevalence has overshadowed the slow growth of healthcare facilities and healthcare provision in East Africa.

The prevalence of hypertension in Kenya is around 24% (Mwangi et al., 2020). NGOs, government facilities, community facilities, and private health facilities provide healthcare in Kenya. Most insured Kenyans are under NHIF, a government offered health insurance facility. Those in rural areas lack access to healthcare because of long distance to the nearest health facility.

A study using a dynamic GMM model and panel data to illustrate how corruption significantly affects the impact of health expenditure. Adult mortality raises public funds that are misused (ODHIAMBO, 2014). Investing in healthcare infrastructure, education, and expenditure in health initiatives will reduce the challenges of hypertension. Educated people make healthier lifestyle choices.

Statement of the Problem

High blood pressure is a precursor to cardiovascular diseases that cause most mobility and mortality globally. Both biological factors and environmental factors affect its prevalence. Social economic factors include education, insurance coverage, the distance to health-facility, and obesity.

There is need to determine the cumulative effect of obesity, access to health facility, education, and insurance coverage on high blood pressure. This will inform future police interventions. The effect of socioeconomic factors on the prevalence of hypertension is high on the lower economic strata, emphasizing the need to monitor those with the highest disadvantage in terms of education.

OBJECTIVES OF THE STUDY

The main objective of this study is to determine the effect of insurance education, obesity, and distance to the nearest facility on high blood pressure health outcomes.

Specific objectives are

To evaluate how public health insurance coverage affects access to high blood pressure diagnosis and treatment.

To evaluate how lack of basic education affects access to high blood pressure diagnosis and treatment.

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THEORETICAL FRAMEWORK

This framework addresses empirical investigation of factors affecting high blood pressure and health outcomes. The study adopts the production function derived from the Grossman model of health demand. The model views health as a commodity that individuals produce through better health management. The dependent variable in this study is high blood pressure, while independent variables are insurance, education, access to health for acidity, and obesity.

All four variables are inputs in the production function. Whereby, insurance is the access to health, education, lifestyle choices indicated by obesity, and proximity to health services. Insurance encourages access to health through regular checkups that translate to early disease detection and effective management of diagnoses of ailments. Educated people are literate, more informed, make better health decisions about healthy lifestyles, and utilize available healthcare effectively. This translates to better management of high blood pressure.

The people who live closer to health facilities have lower costs of accessing help facilities and are therefore encouraged to visit health facilities frequently. The numerous visits will increase or preserve health capital. Obesity affects high blood pressure, and it is due to an inactive lifestyle. It is related to income and food availability. These factors influence the stock of health capital. Education is a factor that can amplify the benefits of proximity to healthcare facilities, insurance accessibility, and obesity. The empirical analysis of this study uses a health production function.

CONCEPTUAL FRAMEWORK

The health production function is given by;

$Hi = f(Xi, Zi, \epsilon i)$

Where,

Hi is the health outcomes in county i. It is indicated by high blood pressure.

Xi is a vector of inputs that determine socioeconomic perspective. (education, insurance coverage, obesity, and distance to health facility).

Zi is a vector control variable such as gender and income.

ϵi is an error term that shows unobserved factors influencing health outcomes.

The linear specification of the health production function is shown below.

$Hi = \beta 0 + \beta 1 Ii + \beta 2 Ei + \beta 3 Di + \beta 4 Oi + \gamma Zi + \epsilon i$

Where;

$\beta 0$ is the intercept

$\beta 1$ is the coefficient of insurance given by Ii

$\beta 2$ is coefficient of Education given by Ei

$\beta 3$ is the coefficient of distance given by Di

$\beta 4$ is the coefficient of Obesity given by Oi

γ is the coefficient of control variable Zi

The model can be extended to show effects of combined variables such as combination of insurance, and education distance and obesity as shown below

Hi = β0 + β1Ii + β 2Ei + β3Di + β4Oi + β5(Ii x Ei) + + γZi + ϵi

MEASUREMENT OF VARIABLES

Health outcomes h i is the measure of presence of high blood pressure is a continuous variable showing blood pressure levels in the County.

Insurance given by ii please the measure of prevalence or cover coverage of NHIF in a given County

Education is a continuous variable showing those without primary education in a given county.

Distance is a continuous variable showing distance of less than 30 minutes to the nearest health facility

Obesity is a continuous variable showing BMI in a given county

THEORETICAL LITERATURE REVIEW

The Grossman model is based on the human capital model. The foundation of the theory is that health is assumed to be a normal good that has been produced. The inputs towards making health are healthcare activities. The traditional demand theory has it that a consumer has a utility that allows him or her to have a preference of goods in the market. Maximization of the utility is subject to a budget constraint. The difference between demand for health and demand for other commodities is that goods purchased for better health are not the end in themselves unlike other goods, whereby commodities are demanded to maximize utility directly. Demand for health products such as drugs and medication are demand for healthy life.

The human capital theory is different from health capital model, in that, the human capital theory increases a person's productivity in a market environment, while the health capital model shows that a healthy person can work longer and make more income. The study uses a household production function to show the difference between health output and healthcare as an input. The concept of hustled production function is drawn from the farm production function. The similarity draws from the fact that in the farm inputs and time are used in producing goods and services. Sporting equipment and time produce recreation, and transportation services produce tours to destinations.

Some inputs of the household production function directly enter the utility function, while others are indirect. For example, there is investment in books, teachers, time, services, and computers. The health capital model is different in that it increases both income and wealth and enters production, or rather the utility function, directly. In that way, health is both a consumption and investment commodity.

Health capital is a component of human capital that is acquired at birth. However, after a certain age, it begins to reduce. It is at that age when someone can invest in health to increase health capital. The forms of investment include diet, exercise, medical care utilization, cigarettes smoking, and alcohol consumption. The years of schooling play a big role in enhancing efficient consumption of health, as defined by the amount of health obtained from a given amount of health inputs.

Education is a key factor that contributes to efficient consumption of health, in that as prices of health input increase, the quantity of health demanded reduces. Education leads to better lifestyle choices and diet and nutrition, which actually reduction in demand for health and unit cost of health resulting in more efficient consumption of health. Education also simultaneously increases demand for inputs of health, which translates to better health.

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Despite the fact that health follows normal demand, where it slopes from left to right downwards. It is important to know that some factors may contribute to increasing the demand for health despite increased concern about health inputs. For instance, as a person grows older, demand for health increases regardless of health input. In the same light, it is possible that as consumption of health increases the demand for health may reduce at a certain age.

EMPIRICAL LITERATURE REVIEW

Health Expenditure

Bangladesh is among many developing countries that are experiencing an escalation of healthcare spending. That is a clear indicator of growing demand for healthcare services in Bangladesh. Public funding has increased in response to the increase in demand for healthcare services. The study examined impact of healthcare expenditure on health outcomes. The indicator of health outcomes was mortality rate. The spread of infectious disease was also of concern in the study. The data set has 10 series. The data that covers period 1990 to 2019. It was collected from international and national sources.

Variables in the study for annual health expenditure by the government as a percentage of GDP, number of registered doctors per capita, health expenditure, the number of shallow tube wells in rural areas, private hospitals, and number of public and private medical colleges. The variable tube well was included because the study looked at infections and waterborne diseases such as cholera. Data analysis involved the use of augmented Dickey-Fuller (ADF) tests for stationarity, and Philips Peron (PP) test. The study used the vector auto regression with exogenous variables model (VARX) and found out that per capita health expenditure has a positive effect on life expectancy, maternal, and child health. The number of doctors also had a positive effect on maternal and child health, and life expectancy, and that's data cost by cholera, diphtheria, malaria, and tuberculosis incurred by increment in government annual expenditure. The study recommends that the government should prioritize sufficient allocation of funding to develop a healthcare system (Sabiha, et al., 2024).

Child mortality, maternal mortality, HIV/AIDS, and malaria mortality in Ghana and Nigeria. The study uses the Abuja declaration of 2000 and the 1999 United Nations General Assembly guideline. The findings in Ghana showed a negative relationship between health expenditure and health outcomes of variables under study, while in Nigeria the relationship was positive. The study recommends enhanced public expenditure on health considering the GDP among urban dwellers, and school enrollment (Oladosu, Timothy, & Uchechi, 2022).

A study examining the impact of healthcare expenditure on health outcomes in the Middle East and North Africa region used time series data from the World Bank and WHO for the period 1990-2010. The panel data estimated the combined impact of private healthcare and government expenditures on infant under-five and maternal mortality rates. It employs the random effects model, pooled ordinary least regression, and the Hausman-Taylor instrumental variable model. The findings show that private and government spending on healthcare reduced infant mortality by 8.6-9.5 per 1,000, under-five mortality reduced by 0.3-12.1 considering five deaths per 1,000 live births, and maternal mortality rate by 25.8-225.9 deaths per 100,000 live births. The study concludes that both expenditures improve health outcomes. Adult literacy rate, safe drinking water, and medical provision from skilled healthcare providers also contribute to better health outcomes (Fevzi, Hamidi,, Suvankulov,, & Akhmedjonov, 2014).

A study on the impact of health expenditures on health status in Nigeria uses time series data for the period 1986-2020. Independent variables in the study are health capital expenditure, recurrent expenditure, level of education, and GDP per capita. ECM and cointegration techniques were used in the study. The study concluded that health capital expenditure and recurrent expenditure reduce infant mortality rate in Nigeria. The level of education and GDP per capita had similar effects. The study recommends funding and maintenance of the healthcare system (Nuhu, 2022).

The African Development Bank made a publication on health expenditures and health outcomes in Africa. The study provides an econometric link between government health expenditure, African countries per capita total to health outcomes. Infant mortality and the under 5 mortalities are the main outcomes considered. The panel data was of 47 African countries in the period 1999 to 2004. Human immunodeficiency virus prevalence positively affects health outcomes, female literacy, and the number of physicians significantly reduced health outcomes (Anyanwu & Erhijakpor, 2007).

A unique study based on the classification of public health expenditure using panel data considered infant mortality, life expectancy, and under-five mortality as variables. The data used was for the period 2000 to 2015. The panel data regression model was used on the data extracted from the World Bank website. The study concluded that public health expenditure was more effective than private help expenditure across different levels of middle-income and high income countries (Aziz, Abdoreza , Farhad, Movahed, & Samira, 2019).

The study on healthcare spending and health outcomes, evidence from selected East African countries, outlines that both public and private expenditure on health have improved and health outcomes such as life expectancy of infants have improved. The study used panel data to regress data from the World Bank website for the years 2000- 2014. The findings showed positive association between public and private expenditures and life expectancy. The expenditures improve the health outcomes of women more than that of men in terms of life expectancy. The relationship between neonatal mortality, infant mortality, under-five deaths with expenditure was negative. The study recommends investment in healthcare facilities to improve positive health outcomes (Murad, Unlucan, Olowu1, & Kalifa2, 2017).

A study on the impact of government health expenditure on health outcomes in Nigeria used time series data from the Central Bank of Nigeria and World Bank development indicators. The health outcome was the malaria incidence rate. Government education expenditure, pocket expenditure, and government health expenditure are independent variables in the study that run from 1988 to 2021. The cointegration results of the ARDL model show a long-run relationship between malaria and the independent variables. The short-runs results showed that government expenditure had an insignificant negative effect on malaria. Out-of-pocket spending has significant positive effects on malaria. The study recommends that the government should focus on providing healthcare services and infrastructure. A collaboration between health sector, and education institutions, as well as integration of health education to form an online learning system. This will go a long way in reducing malaria incidences (MOHAMMAD,, GODWIN , & ADAMS, 2023).

A study used African health accounts to determine the effect of health expenditure on health outcomes. The data was released by the World Health Organization in 2011. Key dependent variables in the study are under-five, neonatal, and life expectancy at birth. The independent variables are public and private expenditures. The period was from 2002 to 2014, and covered 14 countries. The findings from the study showed that public expenditure on health does not necessarily increase with an increase in GDP. The result is that there is no direct correlation between reproductive health expenditure and paternal mortality. However, multivariate regression results show that life expectancy at birth, child, and neonatal mortality improved with an increase in public health expenditure (Nikoloski & Djesika, 2018).

A study on the impact of public health expenditure and health outcomes was conducted for the years 2002 to 2016 in nine provinces of South Africa. The indicators of health outcomes were life expectancy at birth, under-5 mortality, and infant mortality rate. The independent variables are health expenditure given by per capita health expenditure in index of ethnolinguistic fragmentation, female literacy rate, urbanization given by urban population, and number of Physicians. The control for heterogeneity of individual provinces and time effects was achieved using random effects and fixed effects panel data estimation techniques. This selection was based on the outcome of the Housman specification test. The impact of public health expenditure on each separate was determined using a seemingly unrelated regression (SUR) model and the least squares dummy variable model (LSDV). The findings show that provision management and available infrastructure

determined the relationship between public expenditure in individual provinces (Besuthu, Kin, & Dumisani , 2019).

The study on health expenditure and child health outcomes used data from 45 sub-Saharan countries to investigate lagged effects. World Bank development indicators provided data for the years 1995 and 2011. Infant under-five and neonatal maternal were indicators of health outcomes. Health expenditure and private health expenditure are aggregated in the analysis. The study uses the Grossman model in the theoretical framework. The health production function is developed from the growth man model and used in empirical analysis. The variables in the study include total health expenditure, public health expenditure, private have expenditure, real GDP per capita, DPT immunization, education focusing on secondary school enrollment, sanitation, HIV prevalence, urbanization, the population age 14 years and below, the population aged 15 to 64 years, and per the population age over 65 years. The study employed fixed effects and random effects models. The findings showed that public expenditure was more influential on health outcomes than private expenditure. Total expenditure and positive significant effect on health outcomes. The elasticity of infant mortality and under-five mortality, and neonatal mortality was -0.11, - 0.15, and - 0.08 respectively. The lagged effects was equally significant and had positive effect on health outcomes. The study recommends sustainable expenditure on the health of children because there is a lagged effect that might hamper any problem that has been made when there is future reduction in expenditure (Novignon & Lawanson, 2017).

A study on public health expenditure and health outcomes in Cameroon used time series data from 2000-2017. Variables seek to determine the effect of geographic distribution on health outcomes. The data was obtained from the World Health Organization, the United Nations Children's Fund, and the World Bank. Data analysis was done using OLS regression from the Grossman model. The findings show that public health expenditure as a positive association with higher life expectancy, lower under-five mortality, and lower maternal mortality. The study recommends unbiased provision of healthcare (Ayimaleh, 2023).

A study on public health expenditures and health outcomes use data for the years 1980 to 2014 in Ghana. Indicators of mortality are life expectancy at birth, under 5 mortality rate, and infant mortality rate. The independent variables are public health expenditure, education of both males and females, education of female, education of men, physicians, immunization uptake, private health expenditure, per capita income. The two stage least square (2LS) and the OLS techniques are used in analysis. The findings from the study show that a 10% increase in public expenditure reduces infant and under-five mortality by 0.102-4.4. The same expenditure increases life expectancy by 0.77 in 47 days of the year. Income had a greater effect than public expenditure on health outcomes. The study estimates the averted child mortality cost at 0.2 to 16 US dollars. The cost of extra life gained ranges from 7 US dollars to 593.33 US dollars. The rising income inequality makes it necessary for the government to spend on health in order to improve health outcomes of majority of citizens. (Boachie, Ramu, & Põlajeva, 2018)

A study on the effects of private and public health expenditure on health outcomes in the US studied 11 OECD countries. Indicators of outcome are child mortality, infant mortality, and under-five mortality. Fixed effect GLS and GMM models are confirmed by the Housman test. The findings of the study show that the number of Physicians has a significant effect on health outcomes, unlike public and private expenditures that had no significant effect. The insignificance of expenditure is attributed to high inflation (Hyungue).

The study on health expenditure, health outcomes, and economic growth uses data from World Bank development indicators for the years 1995 to 2011 in 40 sub-Saharan African countries. Primary education enrolment is a unique variable in this study. The fixed effects model investigates the effects of health expenditure on health outcomes, while the generalized method of moments (GMM) investigates the effect of health outcomes on economic growth. The panel vector auto-regressive model (PAVR) tests the causal relationship between three variables highlighted in the topic. Findings show that health expenditure has a negative inelastic effect on health outcomes. Life expectancy at birth was significantly influenced by private expenditure, while public expenditure significantly reduced mortality. Public and private expenditures complement each other. Proper sanitation, clean water, and immunization improve health outcomes. Urban

population growth and the prevalence of diseases reduce health outcomes. The mortality rate has a stronger influence on economic growth than life expectancy. Physical capital, openness to trade, and education had a positive effect on economic growth. Health outcomes and economic growth, and empty expenditure and health outcomes are both exhibited by directionality. The expenditure and economic growth have unidirectional causality. The study recommends an increase in public health expenditure through public insurance programs to reduce negative health outcomes. Secondly, there is a need to improve on the environment to have desirable health outcomes (ARTHUR, 2015).

A study of healthcare expenditures, health outcomes, and governance in Africa used panel data for the years 2003 to 2015 from 48 African countries. Most of the African countries had high mortality rates of infants and children. The same countries spent 5% of their GDP on health. The variables indicating health outcomes are the infant mortality rate and under-five child mortality rate. Expenditure variables are real GDP per capita, total health expenditure, government healthcare expenditure, and out-of-pocket expenditure. Other variables were total fertility rate, sanitation, urban population, female labor in agriculture, foreign direct investment, secondary school enrollment, and government effectiveness indicator. The study showed that increasing expenditure on health as a percentage of GDP lowers the mortality rate. A fixed effects model was used in that study (Nsereko, 2018).

A study on the impact of healthcare expenditures on healthcare outcomes in the Middle East and North Africa: A cross-country comparison for the years 1995 to 2015. The study eliminated the impact of inflation on health expenditure from the results by adjusting using the CPI index of 2015 as the base year. The data used in the study was extracted from the World Bank development indicators and WHO health statistics. SPSS application was used in the analysis. The study found out that despite the fact that countries are increasing expenditure on health there is variance in health outcomes. For instance, some countries have shorter life expectancy compared to others despite a high expenditure on health. The study attribute the variance to the poor allocation of resources in health expenditure models. The conclusion is that if those countries that allocate resources poorly increasing expenditure on health, there will be no change in health outcomes (Balkhi, Alshayban2, & Alotaibi, 2021).

A study on the government health expenditure and health outcomes nexus: A study on OECD countries used the GMM model, which is a generalized method of moments on panel data running from 1996 to the year 2020 in 8 OECD countries. The indicators of health outcome, infant mortality, and life expectancy. Other variables are income, government health expenditure, per capita GDP, population, and number of doctors. Defining the study revealed a positive effect of health expenditure on life expectancy. The effect on infant mortality is negative. The number of doctors, per capita GDP, and population have a negative effect on infant mortality. The study recommends an increase in health expenditure to improve health outcomes. The study emphasizes the need for a quality environment and good economic conditions in desired health outcomes (Anwar, Hyder, Nor, & Younis, 2023).

A study on government health expenditure and public health outcomes: A comparative study among EU developing countries use factor analysis and regulation analysis. Independent variables in the study are public health expenditure as a percentage of total health expenditure, gini coefficient, real GDP per capita, unemployment, quality of life and governance, and socioeconomic vulnerability. Factor analysis formed the basis for computing the last three variables. The other variables were obtained from the World Bank and the Eurostat database. The study found that there is a long-run relationship between public health expenditure and health outcomes. Infant mortality reduces while life expectancy increases as health expenditure increases, good governance improves effectiveness of health and reduces infant mortality. The study recommends an aggregation of policies aimed at improving healthcare outcomes because consolidated healthcare system performance has highest impact on life expectancy (Onofrei, Vatamanu, Vintila, & Cigu, 2021).

A study on the comparison of the effects of public and private health expenditures on health status used panel data to analyze Eastern Mediterranean countries. The study identified social security spending, foreign resources like subventions and loans, and taxes to private and public sectors as public health expenditures.

Private health expenditures include out-of-pocket expenditures, and private insurance. The variables in the study are infant mortality rate, public health expenditures per capita at purchasing power parity, private health expenditure per capita at purchasing power parity, gross domestic product per capita at purchasing power parity, proportion of population under 15, portion of population between 15 and 64 years, female labor force participation, fertility rate, mean years of schooling for people over 25 years, and population who live in urban regions. The Cobb-Douglas equation is linearized using logarithms. The panel data covering the period 1995 and 2010 followed the Pesaran CD test and CADF unit test before proceeding to the Westerlund panel co-integration test. The random effects model is employed after confirmatory tests from the Breusch Pagan and the Hauseman tests. The test results show that infant mortality rate and public health expenditure are inversely related. Private health expenditure and infant mortality rate have a positive relationship. The relationship with private health expenditure was insignificant, while that of public health expenditure was significant. The conclusion of the study is that public health expenditure is more effective than private health expenditure in improving health outcomes of infant mortality (Rad, et al., 2013).

A study on public policy and health outcomes looked into the impact of health expenditure on life expectancy and child mortality. The study used the ARDL model on data for the years 1984 to 2020. The findings of the study showed a negative short-run relationship and a positive long-run relationship between health expenditure and life expectancy. The effect of health expenditure on mortality was not significant. The short-run relationship shows that government expenditure has positive health outcomes. A healthy lifestyle, a clean environment, and government expenditure result in the long-run relationship. The study advocates for a low cost health intervention and health promotion, and an increase in effective spending. There is a need for the countries to increase their allocation of health expenditure and match it to that of developed countries. Governments should also find ways of increasing their revenue to increase expenditure on health (Alimi, Odugbemi, & Bukonla , 2023).

A study on the impact of government health expenditure on health outcomes in West African sub-region used panel secondary data from the years 2000 to 2015 in 13 countries. Dependent variables in this study are gross domestic product per capita, government expenditure on health, and unemployment. Analysis was done using fully modified ordinary least squares (FMOLS). The findings of the study show an indirect impact of government expenditure on infant mortality (Mustapha,, Onikosi-Alliyu, & Babalola, 2021).

A study on improving Health Act outcomes towards inclusive sustainable development in Africa questions the relevance of health expenditure. It uses data for the period 2000 to 2016. It uses life expectancy, under-five mortality, and infant mortality. The findings from the GMM model show that health expenditure reduces under-five mortality and infant mortality rates. Health expenditure increases life expectancy. Openness, real income, and ethnic fractionalization increase life expectancy. Corruption, urbanization, and CO2 emissions reduced life expectancy. Ethnic fractionalization did not have significant effects on under-five mortality (Martins).

A study on the impact of health expenditure on health outcomes in Sub-Saharan Africa studied 46 countries in the years 2000 to 2015. Indicators of outcome were life expectancy, under-five mortality, and maternal mortality. The findings show that physicians per 1,000 population, under 5 mortality, population above 65 years, and GDP per capita are significant determinants of health expenditure. Other dependent variables were governance effectiveness, HIV prevalence, the interaction of health expenditure and quality of regulation, the interaction of health expenditure and governance, and CO2 emission (Amponsah, 2019).

METHODOLOGY, RESULTS, AND CONCLUSION

This study has a correlational research design. It uses secondary data from the poverty report and the demographic and health survey of 2022. The study used Stata 12 in data analysis. Log transformation of the data is done. The study uses multiple linear regression to analyze the transformed data.

The expanded equation modified from the conceptual frame work gives the question below.

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$Ai = \beta 0 + \beta 1Bi + \beta\ 2Di + \beta 3Ei + \beta 4Fi + \beta 5Gi + \beta 5Hi + \gamma Zi + \epsilon i$

Where:

A is high blood pressure of women, health outcomes

B is employment of women

D is education women

E is public health insurance coverage

F is private health insurance coverage

G is any insurance

H is mental health

Regression results are shown in the table below.

Table 1 Regression Results For Log_A

Variable	Coefficient	Std. Error	t-Statistic	P-value	95% Confidence Interval
log_B	0.0329	0.1688	0.20	0.846	[-0.3091, 0.3750]
log_D	-0.0345	0.0606	-0.57	0.572	[-0.1574, 0.0883]
log_E	***0.7171***	***0.1902***	***3.77***	***0.001***	***[0.3318, 1.1024]***
log_F	-0.0615	0.1158	-0.53	0.599	[-0.2962, 0.1733]
log_G	-0.0476	0.1104	-0.43	0.669	[-0.2714, 0.1761]
log_H	0.0952	0.1008	0.94	0.351	[-0.1089, 0.2993]
_cons	0.0454	1.0956	0.04	0.967	[-2.1745, 2.2654]

Model Summary

Number of Observations: 44

F(6, 37): 9.19

Prob > F: 0.0000

R-squared: 0.5985

Adjusted R-squared: 0.5334

Root MSE: 0.4136

The study concludes that 59.85% of incidences of high blood pressure in women, a health outcome, are explained by independent variables in the health production function. Only public health insurance has a significant effect at a probability of 0.001 on high blood pressure in women. Employment, public health insurance, and mental health have a negative relationship with high blood pressure. Education of women, private health insurance, and any health insurance have a positive effect on high blood pressure in women.

The study recommends strong public health insurance coverage as a control and preventive measure for high blood pressure in women in Kenya.

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