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How Public Health Expenditure Affect Health Outcomes in Cameroon

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Walden University
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Abstract

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Executive MBA, Wekerle Business School Budapest, 2017

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Doctoral Study Submitted in Partial Fulfillment

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Abstract

Most African governments, and Cameroon in particular, have identified the reduction of infant mortality and life expectancy in Africa as a critical priority. The United Nations Millennium Development Goals set a target objective of reducing infant mortality by 60% from 1990 to 2015 in less-developed countries. Good health contributes significantly to the attainment of sustainable development and health outcomes. Despite Cameroon's progress in achieving health-related Millennium Development Goals regarding reducing infant mortality and increasing life expectancy, the country is still worse in respect to health outcomes compared to other Sub-Saharan Countries like Nigeria and Ghana thus more need to be done by the Cameroon Government to improve infant mortality and life expectancy. It has experienced challenges involving attaining positive results for its population. This study's primary focus was to investigate Cameroon's public health expenditure and health outcomes using time series data from 2000 to 2017. Data sets used for this study were from the United Nations Children's Fund, World Health Organization, and World Bank. Grossman's human capital model of the demand for health served as the theoretical framework. Ordinary least squares regression was employed to evaluate the effect of public health expenditure on life expectancy and infant mortality. The data analysis showed that public health expenditure per capita was positively associated with lower maternal mortality, lower under-5 mortality, and higher life expectancy, though this was not the case in all variables studied. The results of this study could lead to positive social change by providing guidance for establishing nonbiased health policy intervention strategies in allocation of public health expenditures in Cameroon.

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Dedication

My Mom, Canicia, who took care of me when I was a kid and saw me achieve this highest academic milestone in my life. All my sisters and brothers were also by me to motivate me to achieve my dreams. Finally, the Almighty God takes all the glory by giving me the strength and focus to arrive at this point.

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To all LECDA communities in Minnesota who were calling me Dr. before I ever arrived at this point, I thank you all for boosting my morale. To my mate, John Ewu, who will soon be finishing his dissertation: I owe you, too, for all the editing and technical skills you rendered to me during my entire journey.

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Chapter 1: Introduction to the Study

Introduction

Public health policy experts have the authority to equitably distribute public health resources to ameliorate citizens' health, develop public health policy programs, and make responsible decisions and public policies to impact citizens positively (Chenwi, 2017). A sustainable health care funding policy must be institutionalized; thus, health care policy designers, planners, and managers should integrate health promotion policy strategies into financial and resource planning (World Health Organization [WHO], 2015). Strengthening the implementation of a community capacity-building strategy could be a way to maximize capital health care and investment resource use. However, Cameroon lacks community health-building strategies due to a lack of appropriate public health expenditures (PHE). Health care is an important input in the health production function and is essential for reducing infant mortality.

Most developing countries with high child mortality, communicable disease, income poverty, and inequality tend to have private health care expenditures. Out-of-pocket (OOP) expenditures remain a significant component of private health expenditures in most countries, especially in those without health insurance systems (Richardson et al., 2017). Unequal public health resource distribution in Cameroon has resulted in high under-5 mortality (U5M), inequitable facility distribution, untrained staff, negative health worker attitudes toward the community, and poor service quality (Shriravastava et al., 2014; Tandi et al., 2015). Human resources in health care also impact maternal mortality, infant mortality, and U5M rates (Anand & Barnighausen, 2004). Improving maternal health and

reducing child mortality requires health care workers with motivation and adequate training.

U5M rates in Cameroon vary by region. Yaoundé, the political capital, had 70 fewer deaths between 1990 and 2004 and 2011 to 2014 (Health Analytic Profile Cameroon [HAPC], 2016). The Southwest, East, and South regions had 66, 60, and 54 fewer deaths per 1,000 live births in the same periods, respectively (HAPC, 2016, pp. 18–19), while the Adamaoua region had only nine fewer deaths during the same periods.

A person with good health can work efficiently, devote more time to economic activities, and be more productive. Good health accounts for a one third increase in Gross Domestic Product (GDP) growth and can positively impact human capital development (Bloom & Sevilla, 2004). Therefore, health care policymakers should prioritize continuous public health assessments, evaluations, and consultations when developing health care goals, needs, and plans. Well-developed health care policies also require development measures for improving health outcomes. Cameroon's economic progress should correlate with the citizens' health and well-being. Promise and Alyce (2020) suggested that per-capita health spending of approximately $138 in 2016 could have contributed to Cameroon's health status. Despite Cameroon's reduced health budget due to fiscal consolidation in an investment plan, the Ministry of Public Health substantially increased health budget allocations to priority, high-burdened regions; however, this budget has not resulted in positive health outcomes (Nkemgha et al., 2020).

Chapter 1 presents the study's rationale, background, research questions, literature gap, and the need for further study for social change. The chapter includes the study's

introduction, problem statement, purpose and nature, significance, theoretical foundation, data sources, and a summary. I provide vital information on PHE and their influence on Cameroon's health outcomes. The results of this study could indicate how to improve infant mortality rates (IMRs) and adult life expectancy (LE), especially in regions with limited health care facility access or where OOP payments substantially impact mortality rates. Additionally, the study could contribute to interventions for reducing health inequalities in Cameroon's most-affected regions.

Background of the Study

Cameroon is a diverse country in Central West Africa. Two presidents have ruled the country since its independence: Ahmadou Ahidjo (1960–1982) and Paul Biya (1982–2021). The country consists of French Cameroon and Southern Cameroon, which received independence in 1960 and 1961, respectively. Despite plentiful and diverse natural resources, Cameron has high poverty levels (DeLancey et al., 2010)

Promise and Alyce (2020) identified health as a fundamental aspect of life; as such, government officials should ensure that citizens have health care as an essential service. Poor health can affect an individual's capacity to enjoy life and produce and consume valuable goods and services; therefore, government officials should provide basic health services for the entire country. The WHO (2012) indicated that health is central to development. A healthy population tends to have increased LE and low mortality, especially children and adolescents, resulting in increased productivity.

Cameroon has a significant health worker shortage. This deficiency differs geographically, with some regions having higher numbers of doctors per person than

others, resulting in poor health outcomes across regions (Tandi et al., 2015). Seventy percent of Cameroon's regions have a health personnel-to-population density per 1,000 people of less than 1.5, showing a severe shortage of health personnel.

The Cameroon health system does not have an insurance coverage plan. Accordingly, residents use rural community health centers that provide care to people without health insurance without exclusion (Ndjepel et al., 2014; Zamo-Akono et al., 2013). However, users must often pay higher health fees above the market price.

The government's responsibility is to prioritize policy development and adjustment, improve health care delivery processes and health outcomes, strengthen relationships with citizens and communities, and increase job satisfaction among the labor force (Chenwi, 2017). The Cameroon government has significant resources allocated to this economic sector, but some primary health outcomes remain deficient, especially the U5M. OOP payments contribute to poor health outcomes in Cameroon, especially in rural areas with limited health facilities and inflated service fees (Fopoussi, 2021).

Another major challenge of Cameroon's health care system is that many health facilities have exorbitant service prices. Cameroon's government officials have allocated 4.1% of the national budget to health, with approximately 70% of the total health expenditure paid by households (HAPC, 2016). Furthermore, Cameroon has the third-highest household contribution in sub-Saharan Africa (SSA), where the average amount spent is 34% (Nde et al., 2019). However, about 64% of households in Cameroon lack health care access because of high health care costs. Many people survive on less than $2 per day, resulting in numerous deaths due to a lack of medical care and the inability to pay

for services (McTavish et al., 2015; Soh, 2013). Cameroon is a member and signatory to most SSA international organizations with the objectives of minimizing risk-pooling mechanisms in the health sector and improving citizens' health outcomes. Moore et al. (2015) found that socioeconomic status and birth circumstances could impact family and child health outcomes, with health potentially deteriorating progressively. Cameroon public health officials must revise their strategies to achieve satisfactory health outcomes.

Vaccination is the responsibility of the Expanded Programme on Immunization, which began in Cameroon in 1976. Cameroon's full immunization coverage improved from 48% in 1986 to 75.9% in 2013. Though coverage rates differ in some regions, with some particular vaccines having more coverage than others, the national coverage rate remains below the 80% WHO/UNICEF target (WHO & UNICEF, 2017).

One measure to improve health outcomes in Cameroon was a governmental free care policy for tropical diseases such as malaria, HIV/AIDS, tuberculosis, and immunization and support services for target populations, such as children under 5 and pregnant women (Fopoussi, 2021). However, according to the HAPC (2016), a free health care public policy is not systematically applied due to limited formal compensation mechanisms. As a result, many pregnant women delay seeking maternal health services, including skilled attendance at childbirth, due to unrealistic costs (Nde et al., 2019).

This study addressed the health-related issues affecting the entire population in Cameroon. Numerous researchers have examined how health expenditures have impacted health outcomes in Cameroon. However, few studies focused on the PHE and its impact on U5M and LE in Cameroon. This study filled the literature gap by providing Cameroon

public health policy officials with recommendations for reducing U5M and improving LE in Cameroon.

Problem Statement

Although Cameroon has shown a minor reduction in U5M, LE has declined to 59 years (World Bank, 2013). Individual families bear the burden of health care financing due to a lack of risk-avoiding mechanisms (Fopoussi, 2021). There are no public resources allocated to health in the most-needed areas (Zounkifirou et al., 2021); thus, there are substantial discrepancies in health outcomes between rural and urban areas and across socioeconomic groups in Cameroon, contributing to poverty and vulnerability to poor health outcomes. The Cameroonian population's general health has deteriorated since the early 1990s. The U5M declined by 54%, from 172/1,000 to 80/1,000 children, between 1998 and 2016. However, child mortality remains relatively high (84 deaths/1,000 live births), greater than the SSA regional average of 75.5/1,000 and twice the global average of 39.1 deaths/1,000 live births in 2017. Northern and Eastern regions have worse-than-national averages (Promise & Alyce, 2020).

Cameroon's leaders have struggled to cure the country's economic and social malaise and have not allocated financial resources to the right sectors. Promise and Alyce (2020) stated,

> In the past 20 years, Cameroon, for instance, has witnessed a decline in mortalities rates of all ages. Unfortunately, this decline did not result in the country achieving its MDG-4 objective of reducing its under-5 mortality by two-thirds by 2015, even though at the inception of the MDGs, Cameroon equipped itself with a "vision

> 2035" and health Sector Strategy for 2016-2027 in between, aimed at re-assuring universal access to quality healthcare services for all social groups by 2035 with the full participation from communities. (p. 17)

According to the President of Cameroon Emergency Plan for Aids Relief (2012), "The government of Cameroon currently allocates less than six percent of its national budget to health, which is far below the World Health Organization's (WHO) recommendation of 15% to meet the health sector Millennium Development Goals" (p. 2). Furthermore, "The Cameroon healthcare system has not been successful in delivering adequate healthcare services to all the population around the country because of limited access to health care facilities and the inefficient use of financial resources" (Zamo-Akono et al., 2013, p. 2).

Cameroon does not have enough medical facilities due to the lack of a well-established public health policy (Ndjepel et al., 2014). The country's public health system has limitations, as health promotion policies have focused on disease prevention and health education yet not provided funds for newly constructed clinics (Zamo-Akono et al., 2013). Thousands of women die worldwide from preventable conditions (WHO, 2017), and approximately 80% of the world's U5M occurred in Africa and South Asia (Ghimire et al., 2019). Cameroon has the highest maternal mortality rate in SSA (World Bank, 2019), as high health care costs remain a deterrent to essential health service access. Maternal and child health affects a country's health performance system.

With no public health insurance in Cameroon, medical costs take up a large proportion of household income; however, they can be difficult to plan for due to the uncertainty of birth outcomes (Dzakpasu et al., 2014). The Bamako Initiative presented

user fees to address financial issues related to primary health care and improve quality and community participation in African countries (Hatt et al., 2013). However, Cameroon, a signatory of this agreement, continues to have exorbitant and questionable user fees for poor households and families who, in most cases, cannot afford them, resulting in poor health outcomes (Dzakpasu et al., 2014).

Few researchers have addressed the impact of the PHE on U5M and LE. Limited studies have focused on PHE's impact on U5M and IMRs, especially in Cameroon. Therefore, this study focused on how the PHE impacts U5M and LE and showed how the PHE could contribute to Cameroon's IMRs and LE. Public health officials and legislators in Cameroon could use the study's findings to discern efficient financial resource allocation, universal health coverage, and appropriate health programs. Such actions could be a way to improve Cameroon's health outcomes, especially U5M and LE health outcomes, and meet the Millennium Development Goals (MDGs) for reducing the U5M by two thirds by 2015, which had not occurred as of 2022.

Purpose of the Study

In this quantitative study, I used ordinary least square (OLS) methods to examine how PHE impacts health outcomes in Cameroon. Individual utility is maximized over its lifetime, and one of the decisions that individuals must make is their investment in health (Grossman, 1972). Grossman (1972) declared investment in health a function of medical care and time spent investing in health. Government officials in Cameroon could use this study's data to improve U5M health outcomes with strategies to alleviate barriers to child health services, especially for families with lower incomes and in remote areas. There is a

need to investigate PHE and health outcomes to develop appropriate policies and improve the declining LE in Cameroon.

Research Questions and Hypotheses

I empirically addressed the fundamental issues in this study with two research questions.

RQ1: Will increased public health expenditures significantly improve both under-5 mortality and life expectancy in Cameroon?

H_01: Increased public health expenditures will significantly improve both under-5 mortality and life expectancy in Cameroon.

H_a1: Increased public health expenditures will not significantly improve both under-5 mortality and life expectancy in Cameroon.

RQ2: Can a quantitative model be developed to demonstrate the costs and benefits of an increased public health expenditures in Cameroon?

Nature of the Study

Quantitative research is a systematic process of investigating a phenomenon by gathering quantifiable data and performing statistical, mathematical, or computational techniques to arrive at a conclusion (Fisher et al., 2014). Quantitative research requires collecting data from existing and potential targets with methods such as online surveys, polls, and questionnaires and depicting the results as numerical data. Scholars conducting quantitative research can make changes and predictions based on data. In this study, the quantitative research method was the approach used to investigate and determine how the PHE impacts health outcomes in Cameroon with OLS methods. Individuals maximize their

utility over their lifetimes, and one decision to account for is the investment in health function, which Grossman (1972) identified as a function of medical care. Secondary data analysis occurred with OLS statistics.

This study included the Cameroon health system and its total population and the U5M and LE rates from 2000–2017 due to data availability. The data analysis occurred with Statistical Package for the Social Sciences (SPSS) v. 28 software. Descriptive statistics of dependent, independent, and confounding variables were used to characterize the population, data, and sample. The study's independent variable was PHE. The dependent variables were the U5M and LE while controlling for the variables of poverty, education, religion, residence, maternal nutrition, maternal age, health insurance, immunization, malaria prevention, antenatal visit, infant weight at birth, and marital status.

Theoretical Foundations

Government leaders worldwide, especially those of developing countries with limited resources, must address the importance of good health for the general population. A United Nations (UN) MDG was to reduce child mortality in developing nations by 60% from 1990 to 2015. Cameroon also had the goal to be an emerging economy by 2035. The top priorities are to reduce child mortality and LE; however, this cannot occur without efficiently allocating health resources. As a result, this study focused on how the PHE impacts health outcomes in Cameroon.

Cameroon has had one of the smallest U5M reductions in the world and declining LE (World Bank, 2013). U5M in the country declined by 54% from 172/1,000 to 80/1,000 children between 1998 and 2016 (Promise & Alyce, 2020). However, child mortality

remains relatively high (84 deaths/1,000 live births), a rate greater than the SSA regional average of 75.5/1,000 and twice the global average of 39.1/1,000 in 2017. Northern and Eastern regions have worse rates than the national average. Families in Cameroon bear the burden of health care financing through OOP payments, and there is a lack of risk pooling mechanisms (Ntangsi, 2014). Thus, government officials have not allotted sufficient public health resources to the areas with the most needs.

There are substantial disparities in health outcomes between rural and urban areas and across socioeconomic groups, thus contributing to poverty and vulnerability. Government officials should focus on improving health outcomes to make Cameroon an emerging economy by 2035. The general health of the Cameroon population has deteriorated considerably since the early 1990s, and the leaders, in particular, have struggled to reduce socioeconomic and social malaise. Health care financing has not received appropriate attention, deemed "unproductive and therefore side-lined from the top government priority programs issues thus belittling the impact multiplier effects of favorable health outcomes in an economy like productivity" (Promise & Alyce, 2020).

Grossman (1999) developed a theoretical health production function model, in which health is $H = F(X)$ and a measure of individual health output, and X is a vector of individual inputs to the health production function F. Vector elements include nutrient intake; income; public goods consumption; education; time devoted to health-related procedures; initial individual endowments, such as genetic makeup; and community endowments, such as the environment. Grossman's model is a means to analyze health production at the micro level; however, this study goal was an analysis of the production

system at the macro level. Moving from microanalysis to macroanalysis meant of representing elements of vector X by per capita variables and regrouping them into economic, social, and environmental factors. Because there is a positive relationship between health expenditures and health outcomes in Nigeria (Issa & Ouattara, 2005), Grossman's model was suitable for this study.

Data Sources and Estimation

This research focused on how PHE impacts health outcomes in Cameroon. The study included country-specific time series annual data from 2000–2017 of PHE, child mortality, and LE in Cameroon, data obtained from UNICEF, the WHO, and World Bank. Regression analysis occurred with the dependent variables of LE and U5M and the independent variable of PHE. I was confident of the data sources' credibility and accuracy.

Limitations and Challenges

The study has limitations and challenges regarding ethical and data availability. Ethical issues occur in most research. The research process can cause tension between community interests and the participants' privacy rights.

The Institutional Review Board (IRB) assesses ethical considerations to ensure they align with the institution's ethics code. Walden University's IRB requires that all studies align with the university's ethical standards and U.S. federal regulations. This study included secondary data from preapproved institutions such as the World Bank and UNICEF.

I used secondary data sources to address the research objectives. Like any other research design, the quantitative design has limitations in terms of application. A crucial

aspect of quantitative research is quantifying how to measure a phenomenon. Too large of a sample indicates unnecessarily involving additional participants, wasting people's time, causing possible harm through unnecessary testing, and incurring extra costs (Altman, 1980). With a too-small sample, the study might not reflect practical importance and waste time, resources, and possibly goodwill. Sample sizes could have different consequences for different groups studied.

This study has some limitations and barriers. However, policy recommendations and results will continue to impact Cameroon's health sector. An increase in health care expenditure could be a way to improve population and infant health, essential health-related MDG components.

Scope and Delimitations

The purpose of this study was to investigate how the PHE affects U5M and LE in Cameroon with a data regression model. Multiple regression entailed controlling for the variables of marital status, poverty, education, religion, residence, antenatal visit, and infant birth weight. Because I used secondary time series data from World Development Indicators UNICEF between 2000 and 2017 in Cameroon, the research did not require a control group and direct observations. PHE was the health care expenditure incurred by the public and local and central governments. UNICEF (2018) presented child mortality as the death of children under 14, broken down as the national mortality of younger children (under 5) who die per 1,000 live births and the number of older children between the ages 5 and 14 who die per 1,000 live births. LE, the years a person is expected to live, is based on estimations of a particular population's average age upon death.

Significance

This study showed how the PHE impacted U5M and LE in Cameroon. The leaders of many African countries have opted to increase PHE to improve health outcomes and maternal and child health services. Most developing countries with high U5M, communicable diseases, poverty, and inequality tend to have PHE (Richardson et al., 2017). Further, OOP spending remains a significant component of PHE in most countries, especially those without social health insurance.

Cameroon does not have a policy for eliminating OOP expenses, which are significant barriers to health care access in the country. There is limited information on PHE and their effect on U5M and LE in Cameroon. The country has some of the highest U5M and lowest LE in SSA.

The study provided information on how the PHE impacts health outcomes in Cameroon. The results could show government officials, health care policy designers and planners, and funding institution leaders that a lack of funding policies for new health facilities could adversely impact health outcomes in rural communities in Cameroon. The study could also contribute to Cameroon's need for interventions to reduce health inequalities in affected areas or regions, as OOP costs can adversely affect health outcomes. Finally, Cameroon's public health officials could use this study's results when making decisions about policy modifications.

Summary

This study used OLS to focus on how PHE affects health outcomes in Cameroon. Legislators should allocate reasonable funds to health care if they want to develop their

countries and improve human capital development and health outcomes. In addition to the country's minor reduction in U5M, LE declined by 25% by the end of 2012 (World Bank, 2013). Public health policy practitioners often use numerous umbrella policy measures to make decisions rather than develop policies specific to public health situations. In most cases, however, they fail to consider the effects of using multiple policies rather than unique policy requirements for individual situations (Ongolo-Zogo et al., 2014).

Research shows that inadequate public health spending is a barrier to health care services in Cameroon. However, there is little information on the effects of PHE on U5M and LE in Cameroon. This study could provide the Cameroon government with appropriate policy recommendations for improving health care.

I critically investigated the topic and achieved the study's objectives by addressing two research questions and two hypotheses. This study included an OLS application with 2000–2017 time-series data for regressions with a focus on ethics and participant privacy. Health care is essential to reducing infant mortality, increasing LE, and improving well-being. Many less-developed countries with high U5M, communicable diseases, low incomes, poverty, and inequality tend to have PHE via OOP payments. Thus, there was a need for this study and government interventions.

This study's results showed how the PHE impacted U5M and LE in Cameroon. The leaders of many African countries have opted to increase PHE to improve health outcomes and address maternal and child health services. This study could provide public health officials with the tools necessary to enhance and improve health outcomes in Cameroon. An increase in PHE could result in a one third increase in GDP growth and improved LE.

Furthermore, the results also indicate the need for interventions to reduce health inequalities in Cameroon's most-affected areas and regions. Chapter 2 presents the study's conceptual frameworks and a literature review of the problem under investigation.

Chapter 2: Literature Review

In recent years, scholars have examined how PHE impact health outcomes, especially U5M and LE. This chapter presents research on the relationship between PHE and health outcomes. Because this study focused on SSA, there is a review of the history of the research problem and PHE. Through old and new literature, this chapter addresses the dynamism of the PHE in Cameroon, the related trends and relevant debates, and the significance and historical precedence as a tangible way to construct knowledge. In addition to the literature review's conceptual and theoretical approach, Chapter 2 includes the conceptual framework; basic health terminology; the Cameroon health system; U5M, LE, and their determinants; the Bamako Declaration; and the fundamental theory in use.

Literature Review Search Approaches

The databases used to search this literature were PubMed/Medline, CINAHL, ProQuest, and Google Scholar. The review includes primarily articles published between 2015 and 2022, although some seminal studies were necessary to address the historical evolution of basic concepts. The keywords were *health care expenditure in Cameroon*, *infant mortality*, *life expectancy at birth*, *under-5 mortality rates*, *public health expenditure and infant mortality in Cameroon*, *user fee*, *health expenditure*, *health reforms*, *out-of-pocket reform*, *health insurance system in Cameroon*, *private medical expenses AND under-5 mortality*, *life expectancy*, *health care expenses*, *mortality rate*, *death or death rate*, *low-income*, *poverty*, *low socioeconomic status*, *poor*, *low income*, *infant*, *child*, *maternal*, *Cameroon*, *sub-Saharan Africa*, and *health care facilities in Cameroon*.

Conceptual Literature

Cameroon Health Care System

In 1989, Cameroon's Ministry of Public Health organized and defined its health care system with Decree No. 89/011. The Ministry of Public Health is the guarantor of Cameroon's health policies. As such, the ministry focuses on health policies, organization and development, technical inspection services, public and private health facilities, relevant professional associations and public health agencies, Ministry of Public Health staff training, Public Health Department staff training and retraining, public health institutions, and cooperation (Işık & Ndıfusah, 2013).

The Cameroon health system has three subsectors: public, private, and traditional medicine. The public sector includes all public and quasi-public health institutions, including those managed by other ministries (e.g., Defense, Employment and Labor; Business, Social, Gender, and Education). The sector's organization is a pyramid, with first-category hospitals on top, followed by the second category of regional hospitals and periphery district hospitals. This subsector has inefficient and dilapidated infrastructure, outdated equipment, and inadequate human resources (Nkemgha et al., 2020).

Traditional medicine is the third subsector in Cameroon, although it also lacks appropriate regulation. However, in recent years, there have been reforms to promote traditional medicine practices in Cameroon. Some government actions to improve and coordinate sector activities include the creation of a Ministry of Health Department for Traditional Medicine, the Centre for Research on Medicinal Plants and Traditional Medicine, and a legal framework for organizing a conventional practitioners association.

Health Care Financing in Cameroon

The public and private sectors address health care financing in Cameroon. Within the public financing mechanism are social health insurance, taxes, and external grants and loans. The private financing mechanism includes direct OOP payments, community-based health insurance, private health insurance, mutual health organizations, and medical savings accounts. This outcome can be measured in terms of prolonged life or years of life gained.

Health care is a serious issue requiring government leaders' deliberation in international forums. As measured by LE, health is a key Human Development Index (HDI) component. Ensuring good health for all was the predominant goal of the MDGs and Sustainable Development Goals. Several health targets in the 2030 Sustainable Development Goals follow the unfinished agenda of the MDGs, which ended in 2015 (Novignon et al., 2012).

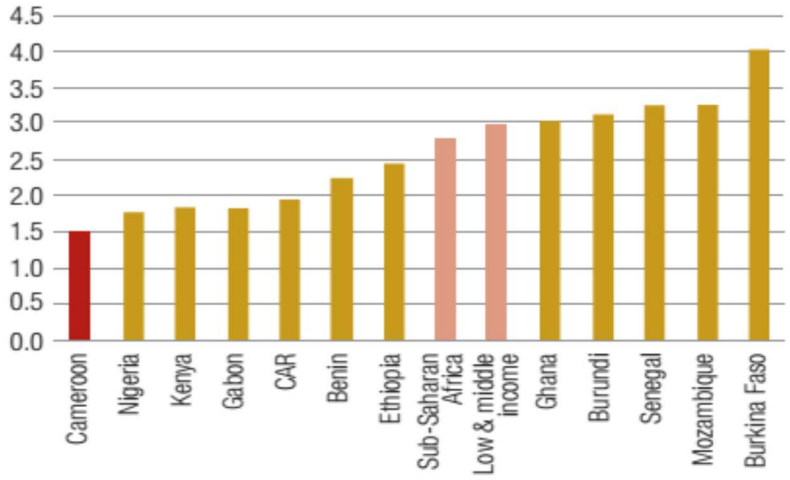
A health system is the overall organization of health systems and care of the population (Işık & Ndıfusah, 2013). Different organizations and health care providers offer population care, such as hospitals, public and private institutions, liberal medical and paramedical practitioners, pharmacies, and equipment suppliers. The primary funding sources for Cameroon's health sector are the state budget, households (through cost recovery and other direct payments), external financing, local authorities, non-governmental organizations (NGOs), and private health insurance, which provides a marginal contribution. The funding sources are vastly disproportionate, with individuals still spending large amounts in direct payments.

According to Promise and Alyce (2020), accountability for the estimated $5,752,750,000 expenses comprised 94.6% households, 3.8% state, and 1.6% external partners. At most, health care receives more than 5% of the country's budget, less than the WHO's 10% standard. Public and private contributions provide the finances for Cameroon's health sector. Private contributions have a significant role due to high OOP expenditures, which account for 94.5% of private spending in Cameroon.

Nde et al. (2019) analyzed the Cameroon health system's two essential features. The health system is pluralistic because it has multiple financing sources and care providers. The main financing sources are the government, public enterprises, foreign aid donors, private enterprises, households, religious missions, and NGOs. The providers are government health facilities, public enterprise health clinics, religious mission health facilities and NGOs, private clinics, pharmacies and drug retailers, and traditional doctors. The health system is also vertical in that financing sources deal directly with providers without intermediaries or financing agents. Figure 1 shows health care financing for Cameroon compared to other African countries.

Figure 1

Health Expenditure 2015 (US per Capita)



Source: World Development Indicators.

Overall, Cameroon has low spending in the health sector. Although the public resources allocated to health have progressively increased over the past 10 years, they remain the lowest resources in Africa per GDP, with an allocation of 1.5% of GDP. Furthermore, compared to other Central African States (CEMAC) countries in the subregion, Cameroon has had the lowest allocation of public resources to the health sector for the last decade.

Public Health Expenditure in Cameroon

Cameroon's annual GDP growth was 3.2% in 2017, the lowest rate in 7 years, and the fiscal deficit peaked at 6.1% in 2016 (World Bank, 2018). Meanwhile, a significant increase in borrowing to fund projects resulted in an increased debt-to-GDP ratio from 15.9 % of GDP in 2006 to 35.7% in 2017. With significant divergence from the Vision 2035 critical socioeconomic indicators, including maternal and child health outcomes, there has

been low and declining government spending on health as a share of the national budget. Government health spending as a proportion of total expenditure and GDP (0.9%) in Cameroon remains one of the lowest in Africa. As part of the General Government Expenditure, public health spending decreased from 6.2% in 2010 to 5.2% in 2016, well below the 14% average for low- and middle-income countries, the WHO's 10% recommendation, and the 15% of the Abuja Declaration Pledge (Nkemgha et al., 2020). The statistics suggest that, over the last 7 years, health-sector spending has not been a priority in Cameroon's budgeting decisions. The low health-sector funding has adversely impacted the country's population, as 40% of the inhabitants live below the poverty line and have low human development indicators (World Food Program, 2018).

Health systems worldwide are diverse, typically due to different health expenditures. Health expenditures can affect health outcomes; therefore, the efficiency of translating health care spending into better health outcomes can vary significantly due to health system diversity. Scholars have debated the relationship between PHE and national health outcomes, and this relationship remains uncertain (Kim & Lane, 2013). Cameroon's PHE (% of the GDP) increased from 0.93 in 2000 to 1.51 in 2010, but this increase has not correlated with improved health outcomes. Additionally, Cameroon has had meager improvements in its health indicators (World Bank, 2019).

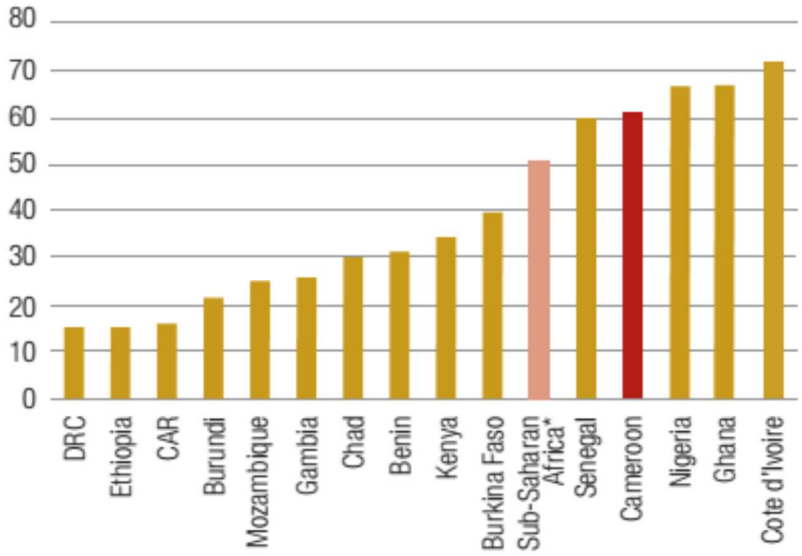
Cameroon has a pluralistic system with multiple financing sources and health care providers (Nde et al., 2019). The primary financing sources are the government, public enterprises, foreign aid donors, private enterprises, households, religious missions, and NGOs. The providers are government health facilities, public enterprise health clinics,

religious mission health facilities and NGOs, private clinics, pharmacies, drug retailers, and traditional doctors. The health system is also vertical because financing sources deal directly with the providers without intermediaries or financing agents.

Cameroon has multiple financing sources for PHE, but OOP user fees from private-sector health facilities remain a major burden to households. The Ministry of Public Health addresses the bulk of government spending and health financing. External financing data come from individual donor agencies in and out of the country (Işık & Ndıfusah, 2013). In 2012, the United States, through the Centers for Disease Control and Prevention (CDC), provided an $8.5 million donation to Cameroon. Some public enterprises have health facilities, and those without have private for-profit facilities for workers. In addition to user fees and drug sale profits, religious mission and NGO members finance some of their activities through donations of staff, drugs, and equipment from abroad. A smaller fraction of government spending is allotted to the Ministry of Armed Forces, which provides health services to the military and police; the Ministry of Secondary Education, which focuses on hygiene and immunization for school children; the Ministry of Higher Education for its university hospital; and the Ministry of Social Affairs, which provides various community health programs (Promise & Alyce, 2020). Figure 2 shows the PHE of some African countries.

Figure 2

Public Health Expenditure for Selected African Countries (Percent of GDP)



Source: World Development Indicators.
Note. *excluding South Africa, Somalia, and Zimbabwe.

As shown in Figure 2, Cameroon has a relatively high public health allocation compared to other SSA countries; however, the allocation has not positively impacted citizens, who continue to deal with and often cannot afford high OOP fees. Due to limited public expenditures, many families struggle to afford health services and must make difficult choices. Additionally, OOP expenses present low-income families with the risk of catastrophic payments and impoverishment if spending exceeds 20% to 40% of their household incomes (Robert & Riddle, 2013). For instance, Nigeria has the highest incidence of the catastrophic effect of OOP payment at a 10% threshold of total household consumption and a 40% threshold of nonfood consumption compared to other African

nations, such as Ghana, Kenya, Senegal, Zambia, and Swaziland (Arhegbeshola & Khan, 2018).

Causes of Low Level of Government Spending in Cameroon

Işık and Ndıfusah (2013) focused on the reasons for the low government spending in Cameroon, finding the country had very low public government financing for the health care sector. Countries with a high proportion of the informal sector also have low government spending (high OOP spending) for health. Cameroon's low government financing could be a result of the severe and unprecedented macroeconomic crisis of 1986–1995 in which per capita income fell from $1,020 to $635. The crisis impacted government health spending more than private spending.

Another explanation for the low government health spending is the country's long tradition of a privately financed health care system. Since colonial times, Cameroon's Catholic and Protestant church missions have been an essential and reliable not-for-profit network of health services with user fees. Even government health care, which, until recently, was supposed to be free, has never been free; patients knew they had to pay for drugs and bribe service providers to receive health care services (Işık & Ndıfusah, 2013).

Because Cameroon has few or no risk-pooling mechanisms or measures for preventing or reducing OOP payments, its citizens bear the burden of health care financing (Promise & Alyce, 2020). The National Social Insurance System (*Caisse Nationale de prévoyance sociale*) has a reputation for being overextended, poorly managed, underperforming, and plundered as a slush fund for the government. Despite some progress in management practices in recent years, overcrowding and corruption continue to impact

the state health care system adversely. Family structures and other networks are the only feasible and reliable options for reducing risk.

Informal institutions are means of compensating for gross social differences, yet they have limited scope and quality (Jensen, 2007). In rural areas, traditional family-based relationships of solidarity continue to be means of dealing with social risk; however, these systems have begun collapsing in the cities. Occasionally, there is equivalent coverage through informal savings associations (tontines) or church congregations. Gowen (2015) postulated that facilitating dialogue and "communication exchange among stakeholders encourages a mutual understanding, a free exchange of ideas and arrival at a mutually satisfying solution" (p. 47). Another reason for the low government spending in Cameroon is insurance companies. Like other insurance coverage, health insurance in Cameroon remains minimal, predominantly due to limited awareness. A lack of trust and insurer corruption have also significantly contributed to limited insurance coverage. Because insurance is not mandatory, there is no punishment for citizens lacking insurance coverage.

Many individuals eschew poor state social programs to avoid investing in private or public risk-pooling schemes. In 2005, only 17% of Cameroonians had insurance coverage. Five years later, less than 10% of the population was insured. Insurance companies such as AXA and Allianz Insurance provide health care coverage packages to the health sector, but enrollment remains low due to inadequate awareness and a lack of regulation from the Cameroon government (Nde et al., 2019).

Public Health Expenditures and Life Expectancy

The WHO (2014) indicated that financing health care is fundamental to health system development, especially in Africa, where suitable health care financing could contribute to health care access and health-related MDGs and SDGs. The WHO (2010) also indicated that many developing countries have low health care expenditures due to unsustainable and inadequate grants and loans for significant health care burdens. In 2018, the WHO presented a transformation course for global spending on health, suggesting increasing domestic public funding and decreasing external financing for all WHO Member States between 2000 and 2016. Just as financing health care services varies globally, so does health care spending (Poullier et al., 2002). Poullier et al. (2002) examined the National Health Accounts Methods for the Organization for Economic Co-operation and Development (OECD) countries, statistical yearbooks, and national and international health care spending reports for non-OECD countries and all 191 WHO countries. The authors found that high-income countries had greater health care financing allocations, while countries with low expenditures for health care services had poor health conditions. These findings aligned with Maruthappu et al. (2014), who examined comparative country-level data of 176 countries from 1981–2010. Multivariate regression showed that reduced government health spending correlated with significant increases in child mortality, especially in low-income countries. Because countries with high PHE have better health outcomes than countries with low PHE, public resources allocated to the health sector contribute to better health outcomes.

Health care financing reforms have occurred across high- to low-income countries for the past decades. After the Bamako Initiative, the Post-Independence Health Financing Reform required individuals to pay for OOP health services as a cost-recovery strategy. However, this policy has resulted in inequitable health care access, with the burden falling most heavily on underprivileged households. In 2013, the Cameroon Economic Update indicated that Cameroon's leaders spend more money on health than any other SSA country, except South Africa: US $61 per capita as opposed to US $51, on average. However, Cameroonians continue to shoulder most of the financial burden. Out of the $61, the state provides only $17, $8 of which comes from international donors. There is a strong correlation between health and revenue statistics, with well-off households and wealthy regions having better access to health services (Nkemgha et al., 2020).

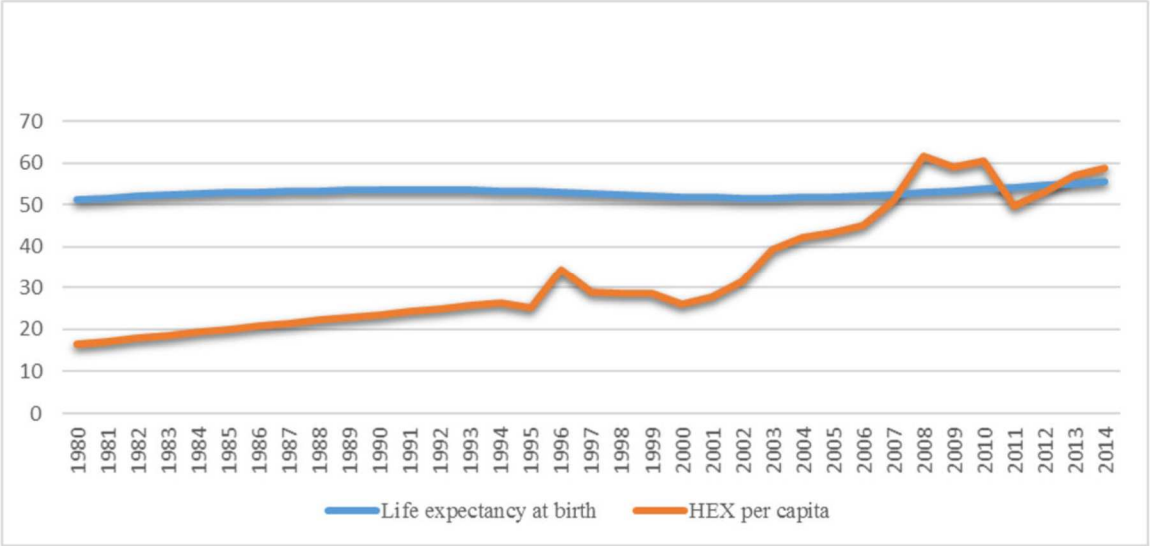
According to the Human Development Report of 2015, LE in Cameroon increased from 51.2 years in 1980 to 55.1 years in 2013. Health care is a serious issue requiring deliberation in international forums. As measured by LE, health is a key HDI component; thus, good health for all has been a key MDG and SDG target. Several health targets in the 2030 SDG follow the unfinished agenda of the MDG, which ended in 2015 (Promise & Alyce, 2020)

As health expenditures increased from 1980–1993 in Cameroon, LE also marginally increased (see Figure 3). However, as health expenditures dropped from 1993–1996, LE also decreased. The fall in per-capita health expenditures could have resulted from massive salary cuts, including the 60% decrease in civil servants' salaries in 1993, the CFA franc's devaluation in 1994, and the decline in the state budget for the health

sector (Owoundi, 2013). Although health expenditures increased considerably after 1996, there has been a small corresponding increase in LE compared to other periods.

Figure 3

Evolution of Life Expectancy in Cameroon



Note. Evolution of LE at birth and health expenditure per capita (HEX) in Cameroon from 1980 to 2014.

Anand and Ravallion (1993) examined the relative roles of private incomes and public services with cross-country data for 22 countries. The findings showed that health care spending, particularly public health spending, contributed to health status and LE at birth. An examination of health care expenditures and outcomes across 10 Canadian provinces between 1978 and 1992 showed that lower public health spending correlated with a significant increase in infant mortality and a decrease in LE (Crémieux et al., 2014). Nixon and Ulmann (2006) focused on three health outcomes measures (LE at birth for male and female infants and IMR) and the explanatory variables of per capita health expenditure,

number of physicians (per 10,000 population), number of hospital beds (per 1,000 population), average hospital of stay, in-patient admission rate, alcohol and tobacco consumption, nutritional characteristics, and environmental pollution indicators. The authors concluded that although health expenditures and the number of physicians correlate with improved infant mortality, public care expenditures marginally contribute to LE in European Union countries.

Akinkugbe and Mohanoe (2009) used time series analysis and the error correction model to find that PHE affect physician availability, female literacy, and child immunization. The results showed that public care spending significantly impacted health outcomes in Lesotho. Using panel data from 1995–2010 and fixed and random effect panel data regression, Akinkugbe and Mohanoe also studied how public and private health care expenditures affected health status in 44 SSA countries. The researchers found that PHE significantly impacted health status via improved LE and reduced death and infant mortality. Novignon et al. (2012) also found that public and private health care spending had a strong positive relationship with health status, although PHE had a relatively higher effect.

Elisabeta et al. (2014) examined how health expenditures affected LE in six global regions (the Americas, Southeast Asia, Europe, Africa, Eastern Mediterranean, and Western Pacific) with a fixed-effect model of data from 1995–2010. The study showed that health expenditures positively and significantly affected LE at birth in all six regions. Iiori et al. (2017) found public health spending positively and significantly affects LE at birth in Nigeria. Richardson et al. (2017) also noted that public health spending positively and

significantly affects LE in Nigeria. Bein et al. (2017) found a positive and significant correlation between the two variables.

Empirical Literature

Public Health Expenditure on Health Outcomes in Cameroon

Boachie et al. (2018) examined the relationship between Ghana's PHE and health outcomes, finding that, apart from income, the PHE contributed to improved health outcomes. Increasing the PHE by 10% correlated with a 0.12–4.4 reduction in infant and under-5 deaths and increased LE at birth by 0.77–47 days yearly. Piabuo and Tieguhong (2017) focused on the impact of health expenditures and economic growth in CEMAC and African countries. The study indicated that health expenditures positively correlated with economic growth, increased health expenditures, and improved economic growth by 0.4 and 0.3 units for the African and CEMAC countries. The authors also found an increase in LE and a reduction in infant mortality with the same variable.

In examining how PHE impact health outcomes with data from Nigeria from 1979–2012, Oni (2015) concluded that public health spending has a significant relationship with health outcomes. Therefore, the authors suggested improving health-sector expenditures to reduce environmental hazards, such as carbon dioxide emissions, that negatively affect citizens' health to improve U5M and LE. Baldacci (2004) explored the role of health expenditures in the growth process and found that public health spending positively affected growth with the multiplier effects of improved LE and reduced infant death.

Kim and Lane (2013) examined data from 17 OECD countries to empirically analyze the relationship between PHE, public health outcomes, and the implications of

health care policy changes in the United States with two dependent variables (infant mortality and LE at birth). The results showed a significant association between government health expenditures and public health outcomes. Specifically, Kim and Lane found a negative relationship between PHE and infant mortality and a positive relationship between PHE and LE at birth.

Hatasa (2016) examined the impacts of public health spending, economic growth, and PHE determinants in 10 developing countries using log-linear analysis. The results showed that health spending positively affected several health indicators, such as LE and IMR. Nwanosike et al. (2015) investigated progressive health spending and health outcomes in Nigeria using the production function health model and macroeconomic variables from 1970–2013. The study found that health expenditures were one way government leaders could improve vital infrastructural services and health outcomes, especially in reducing malaria, causing IMRs in Nigeria.

Haile and Niño-Zarazúa (2018) studied how public spending in social sectors contributes to human development, economic growth, and aggregate welfare. The authors examined the causal effects of government spending on health, education, and social protection on the HDI and the inequality□adjusted HDI. With longitudinal data from 55 low□income and middle□income countries from 1990–2009, the study showed that government social spending had a significant role in improving LE and U5M.

Philips (2016) used the panel data estimation approach and found that LE and infant mortality had improved over 40 years in most parts of the world, except for SSA in the 1990s. Nwakanman and Ibe (2014) identified a link between PHE and health outcomes in

Nigeria with the OLS and Granger causality analysis. The researchers found a long-running, positive relationship between PHE and health outcomes.

Kar et al. (2011) investigated the causality direction between PHE, infant mortality, and economic growth in Turkey from 1981–2015. Analyzing the data with linear and nonlinear Granger causality analyses, the researchers found a bidirectional causality between economic growth, PHE, and infant mortality. Thus, improving economic growth could be a way to increase PHE via social amenities and improve health outcomes.

Scholars have examined the relationship between PHE and health outcomes with different indicators, models, and countries. Most studies have focused on panel data for developed countries, such as OECD countries (Hitiris & Posnett 1997; Shaw et al., 2008) and the United States (Lichtenberg, 2000). Other researchers have studied developing and less-developed countries (Bayati et al., 2014; Haile & Niño-Zarazúa, 2018). Research findings show that PHE positively and significantly impact LE and mortality.

Other researchers have focused on the relationship between health expenditures and LE (Akif & Mustafa, 2017; Ogungbenle et al., 2013; Ogunsakin & Olonisakin, 2017). Ogungbenle et al. (2013) examined the relationship between PHE and LE in Nigeria between 1977 and 2008 using the Granger causality test. The results showed no effects between the two variables. Akif and Mustafa (2017) addressed the relationship between health expenditures and LE in Turkey between 1975 and 2015 with the Granger causality test and found no causality between the two variables.

Public Health Expenditure and Under-5 Infant Mortality in Cameroon

Spending and Under-5 Mortality

Public health spending could be an indicator of U5M in Cameroon. Government leaders must ensure citizens' health, and allocating sufficient funds for health spending could be a way to improve health outcomes (Fopoussi, 2021). Increased health-sector spending correlates with decreased child mortality in developed and SSA countries (Akinlo & Sulola, 2019; Bein et al., 2017; Dhrifi, 2018; Novignon & Lawanson, 2017). However, Dhrifi (2018) found this connection impacted, especially in medium and wealthy countries. Health expenditures positively correlate with child mortality when they exceed a certain amount; however, only highly developed and emerging nations tend to have such expenditures.

Promise and Alyce (2020) postulated that researching the complex health outcome determinants for child mortality could show a direct positive or negative relationship between PHE and child mortality. Based on this analogy, Kim and Lane (2013) and Kulkarni (2016) stated that the relationship is composite, owing to the connection of a range of factors in the health care production function. Thus, the research has had mixed results on whether increasing PHE correlates with improved U5M. However, public health spending does not occur in isolation.

There is a need for other factors to effectively translate PHE into positive child health outcomes (Dhrifi, 2018). Also, higher incomes could correlate with improved public health facilities for water and sanitation, nutrition, housing, and the ability to pay for health care. Health systems in low- and middle-income countries continue to have challenges

providing medical services; thus, spending may not impact IMRs. Inadequate resource allocation and a lack of maintenance services are the leading causes of poor health infrastructure and personnel distribution. The absence of the multiplier effect from health expenditures in less-developed economies could result from the high costs of medical device purchasing. Another cause for this variation between developed and developing countries is the inefficacy of some health care spending functions.

With corruption common in developing nations, countries might not focus on health-sector spending (Akinlo & Sulola, 2019). Many families in less-developed countries face poverty and poor health situations (Dhrifi, 2018). Accelerating economic growth components, reducing poverty, reducing income inequality, and improving women's education could improve child mortality more than public health spending (Wagstaff et al., 2003). Many infants born to low-income families face health-related problems at birth and other risk factors that progressively affect them as they grow (Robert & Bogg, 2004). Akinlo and Sulola (2019), Bein et al. (2017), and Novignon and Lawanson (2017) found health-related problems in SSA. However, Akinlo and Sulola, Bein et al., Dhrifi (2018), and Novignon and Lawanson used robust methodologies such as the OLS and found that inadequate data in SSA were a limitation of Novignon and Lawanson's findings.

A slight increase in health expenditure could correlate with reduced child mortality. Limited health care spending contributes to poor health outcomes in Cameroon. Cameroon has 5% of the budget allocated to health (HAPC, 2016, p. 6), a tremendously low allocation for its 30 million inhabitants. Fopoussi (2021) found that OOP payments comprise 7% of Cameroon's health spending; therefore, most citizens face poverty while searching for

ways to pay for health care services. Cameroon has numerous health funding sources, so an increased PHE could positively affect child mortality (Dhrifi, 2018; Kiross et al., 2020). Nevertheless, improving child health outcomes requires continuous investments (Fopoussi, 2021). Consequently, there should be a focus on reducing or removing OOP spending to improve the IMR in Cameroon. In medical injury cases, individuals with fewer resources are always out of the market because they cannot pay for medical costs. Removing user fees could be a way to improve health outcomes in Cameroon.

Under-5 Infant Mortality

Scholars often use child mortality rates to measure health status (Fopoussi, 2021). In Cameroon, U5M decreased from 144 deaths between 1990–2004 to 103 deaths per 1,000 live births between 2011–2014 (HAPC, 2016). U5M fell from 92.9 deaths per 1,000 live births in 2014 to 74.8 deaths per 1,000 live births in 2019 (UNICEF, 2019). These figures are lower than those throughout SSA, which had 75.8 deaths per 1,000 live births in 2019 (World Bank, 2020). Access to health care services, women's health-seeking behaviors, and health care service use can indirectly contribute to deaths. U5M is a statistic usually expressed as the number of deaths per 1,000 live births.

Cameroon's different regions have varying U5M due to differing accessibility to and health care service use. For example, the political capital, Yaoundé, had 70 fewer deaths between 1990 and 2004 and 2011 and 2014 (HAPC, 2016). The Southwest, East, and South regions had 66, 60, and 54 fewer deaths per 1,000 live births, respectively, and Adamaoua had nine fewer deaths than other regions in the same periods (HAPC, 2016). The disparity in each area's rates results from an inadequate number of well-equipped

facilities in urban regions, limited health care access, a lack of health services, and a shortage of well-trained health care personnel in rural areas. Health care workers prefer urban cities for better opportunities (Tandi et al., 2015).

Causes of Under-5 Infant Mortality

Preventable diseases usually cause U5M. Poor sanitation and drinking water causing diarrheal illnesses in infants are major causes of infant death. Safe sanitation and clean water could prevent 90% of diarrhea cases, reduce the incidence of diarrhea by 40%, and decrease other major causes of death, such as malnutrition and pneumonia (Alemu, 2017). Although many households in Cameroon, particularly those in rural areas, lack access to good hygienic practices, open defecation has decreased from 17% to 12% over 25 years (Gorham et al., 2017). Often, the toilets are constructed behind houses with no latrines; thus, heavy rainfall washes away the stool, contaminating crops and the wells used for drinking water.

In addition to diarrheal diseases, pneumonia, and poor diet, malaria is among the leading causes of infant mortality. A significant problem in Cameroon, malaria causes 10% of deaths in children under 5 (Severe Malaria Observatory, 2020) and is the leading cause of mortality in a local health care district in Southwest Cameroon (Agborndip et al., 2020; Alemu, 2017). Although there have been effective efforts to regulate malaria, such as the distribution of long-lasting insecticides and mosquito nets, free treatment for uncomplicated and severe malaria for children under 5 and drug resistance remain problematic. Combination therapeutic efficacy in Cameroon fell from 97% to 90% between

2006 and 2016 (Antonio-Knondjio et al., 2019) due to a mutation in the mosquito parasite P. falciparum (Cheruiyot et al., 2014).

Antonio-Knondjio et al. (2019) focused on the record-high gene mutations across Cameroon. Government leaders must monitor drug resistance that could present a threat to eliminating diseases in the country. Additionally, fake drugs and low-quality, counterfeit antimalarial medication, which comprise more than half the medicines sold in the market by private health care providers, have caused the deaths of thousands (Antonio-Knondjio et al., 2019).

Chiabi et al. (2017) reported that vaccines are a simple and effective way to prevent infectious diseases in children and infants between 0 and 11 months in an immunization program. However, the infant mortality in Cameroonrate remains high. Nudelman et al. (2018) postulated how cultural beliefs, religious norms, and a preference for traditional treatments over medical services could also contribute to infant mortality. For instance, women in some Cameroon regions believe that sorcery and ancestors angry about a lack of sacrifices in their honor cause poor nutrition and children's diseases. Many individuals in Cameroon also believe their children will feel worse or die if they go to medical facilities because the disease does not like injections or Western treatment. Some women also think that consuming raw vegetables and sour milk causes malaria and that malaria is a cyclical disease that eventually passes without health care (Nudelman et al., 2018). Consequently, cultural beliefs and a lack of autonomy and authority might sometimes affect women's perceptions about their children's health. Family heads are the ones who decide whether to pursue medical care for themselves and their children (Huda et al., 2016).

Mothers' social, cultural, and economic status also impact U5M and children's health in Cameroon (Fopoussi, 2021). Residence, mother's education and age, and household income directly affect U5M rates in Cameroon. For every 1,000 live births, 36 deaths occur in rural areas, while 25 deaths occur in urban areas (UNICEF, 2019). For every 1,000 live births, 39 and 29 neonatal deaths, respectively, occur among the poorest and wealthiest households (UNICEF, 2019).

Although no data link infant mortality to maternal age in Cameroon, studies from other low-income countries have shown that children born to adolescent and first-time mothers younger than 26 are likely to suffer health outcomes such as diarrhea and anemia, resulting in child mortality. Many adolescent mothers lack vital energy-rich nutrients during pregnancy (Finlay et al., 2011; Neal et al., 2018). As a result, the fetus and the mother may compete for energy.

Bamako Initiative and Infant Mortality in Cameroon

Many researchers have attributed high infant mortality rates in Cameroon and worldwide to the user fees initiated at the Bamako Initiative in the 1980s. The original purpose of the Bamako Initiative was to exempt earners with low incomes who could not afford basic health care. However, due to a lack of appropriate measures, the initiative led to poorer health outcomes and high user fees that have negatively impacted health facility attendance (Watson et al., 2016). The Bamako Initiative resulted in OOP health service payments in WHO- and UNESCO-sponsored African member countries to address health accessibility and primary health care services. The goal was to combine the portion of household incomes spent on the informal economy with government and foreign donors to

improve health service quality and equity for the general population (Bamako Initiative, n.d.; Klein et al., 2016; Ridde, 2011). However, user fees have negatively impacted health care use and coverage, and nearly 80% of African countries (37 of the 41 countries have user fees) have strategies for minimizing or removing user fees (Cotlear & Rosemberg, 2018).

Ineffective administration and user fee reform have resulted in continuous payment requests. In some cases, these fees were eliminated or health services are free, limiting the effect of universal health coverage and the sustainable development goal (Ridde & Yameogo, 2018). The inappropriate application is a barrier to women and low-income families seeking to differentiate between free, government-provided health services and those requiring payment. Paradoxically in some cases, pregnant women in Mali could pay for malaria during their antenatal care while others get it free (Klein et al., 2016). In the rural Northern part of Ghana, some women were still affected by users' fees despite the general reforms made (Dalinjong et al., 2017, 2018).

Klein et al. (2016) found some health care providers levy enormous charges for antenatal services, including free and paid drugs and services. In some African countries, providers hold patients at medical facilities if they do not pay for the services rendered (Yates et al., 2017). Consequently, many women sell their properties, borrow money from relatives, or empty their savings accounts to pay for health care (Dalinjong et al., 2017, 2018). Richard et al. (2010) suggested reducing financial difficulties in maternal care by eliminating user fees, instituting health community insurance systems for obstetric care, and providing coupons for care.

Despite research suggestions, most health service providers in Cameroon continue to charge user fees. Although malaria prevention is a user-fee-free service for pregnant women and their children, women continue to pay for malaria treatment and drugs during pregnancy. User fees for these services are barriers to free health care access that have contributed to deteriorating health outcomes in Cameroon's population.

Empirical Literature on Public Health Expenditure and Infant Mortality

This literature review included empirical studies to address the study's research questions and presented the past and current statistics in the literature. PHE and their effects on health outcomes have been subjects of debate in the Cameroonian economy, especially as many policymakers have applied the wrong policy to resolve health issues. Addressing the issue under study required understanding the empirical research conducted in other countries and U5M and LE in Cameroon (Nkemgha et al., 2020).

Rajkumar and Swaroop (2008) found a positive association between PHE and the child mortality rate in low-income countries compared to higher-income countries. Furthermore, this relationship is governance oriented. The scholars used the OLS regression method to focus examine a sample of 228 observations over 3 years (1990, 1997, and 2003) from 91 developed and developing countries with two governance measures (corruption and bureaucratic quality) and their intersections with public health spending. Rajkumar and Swaroop found that PHE had a greater negative effect on child mortality in countries with good governance, as a 1% increase in PHE showed a corresponding 0.32% reduction in U5M. This effect decreased by 0.20% in countries with average governance and had no outcome in countries with relatively weak governments.

Yaqub et al. (2012) found that PHE have not contributed to better health conditions in most underdeveloped countries due to corruption perceptions and poor governance. As a result, the researchers investigated the effects of the PHE on U5M and LE in Nigeria with country-level data from 1980–2008 and OLS with two-stage least-squares analytical methods. Although Yaqub et al. did not find a positive relationship between PHE, infant mortality, and U5M, PHE's efficacy in reducing infant and U5M positively correlated with the level of governance, indicating the need for good government. Reductions in an economy's corruption index could lead to a decrease in infant and U5M and an increase in LE.

Studies have suggested that there is a positive relationship between health outcomes and PHE; however, this relationship is based on region. Anyanwu and Erhijakpor (2009) found a statistically positive and significant association between PHE, infant, and U5M in SSA. The reduction in mortality occurred slowly in some countries; some North African countries showed increasing child mortality rates, while others showed a slow negative relationship. Similarly, Issa and Quattara (2005) noted that PHE and health outcomes affected economic growth, with a negative association found between PHE and IMR. At a low level of economic development, PHE had a stronger influence on mortality than private health expenditures.

Novignon et al. (2012) investigated the influence of public and private health expenditures on the status of the population of 44 countries from 1995–2010. Public and private health expenditures had a solid and positive relationship with health status, yet PHE had a relatively higher effect. Empirical findings showed that an increase in PHE correlated

with a decrease in IMR by almost four infants, resulting in an increase in LE at birth by 1 year and a reduction in the death rate by nearly 0.8 at a 1% significance level in both models. Kim and Lane (2013) examined the impact of PHE and health outcomes (IMR and LE at birth) on 17 OECD countries between 1973–2000, concluding that PHE are significant public health determinants. Empirically, a 1% increase in PHE correlated with a reduction in the IMR by .077 and an increase in LE by 0.026.

Summary

Cameroon has had declining LE and increasing IMR for the past decade (Nkemgha et al., 2020; Promise & Alyce, 2020). Public policymakers in Cameroon know of the situation and what to do. However, they do not act to address equipment shortages, inadequate supplies, poorly trained personnel, and poor communication networks in rural areas, which contribute to high IMR in the country (Fopoussi, 2021).

Novignon et al. (2012) noted that health care spending was a way to improve health outcomes and LE at birth and reduce IMRs in 44 SSA countries. Bado and Suusuman (2016) found that mortality decreased in some countries between 1990 and 2015. Pritchard and Keen (2016) identified a significant positive relationship between higher IMRs and relative poverty measures in West Asia and SSA. Rajkumar and Swaroop (2008) considered two governance aspects for less-developed countries—corruption and bureaucratic quality—and identified a stronger association between PHE and IMR in low-income countries than in most developed nations. Public health spending significantly and negatively impacts child mortality in countries with good governance. Furthermore, a 1% increase in PHE correlates with a 0.32% decrease in the U5M. This result decreases by

0.20% in countries with standard governance and has no impact on low-governance countries. Chapter 2 showed a gap in the literature and presented recommendations for further research on PHE health outcomes in Cameroon. Chapter 3 presents the research methods.

Chapter 3: Research Method

Chapter 2 presented the literature on how PHE impacts health outcomes, U5M, and LE in Cameroon. Cameroon continues to have high IMRs and declining LE. Therefore, this quantitative study focused on how these trends have affected Cameroon households. This study also provided policy recommendations for future public PHE policies.

The literature shows that PHE can positively affect health outcomes in Cameroon. Promise and Alyce (2020) found that PHE had a negative but insignificant effect on U5M based on full immunization coverage and poverty. Nkemgha et al. (2020) noted that PHE positively affected LE among young people in Cameroon. Although PHE can positively or negatively influence health outcomes, few studies have focused on how PHE impact U5M and LE. Therefore, this study focused on the effects of PHE on the two dependent variables and LE in Cameroon. Chapter 3 presents the research design and rationale for these variables as well as the research methodology, theoretical framework, and population.

Research Design and Rationale

This quantitative study focused on how the PHE impacts health outcomes in Cameroon. Numerical data were the means used to determine the relationship between the independent variable (PHE) and the dependent or outcome variables (U5M and LE) within a population. Quantitative methods include objective measurements; statistical data analysis; data collection via polls, questionnaires, and surveys; or the manipulation of preexisting statistical data with computational techniques. This study had the OLS approach and included secondary time series data from 2000–2017 procured from UNICEF, the WHO, and World Bank. The reason for the time frame selection was the

2001 Abuja Declaration, which requires WHO members to allocate at least 15% of their annual budgets to health care, the MDG to alleviate poverty and improve child health, and the Addis Ababa Declaration on the relationship between poverty and health care provision. This research focused on the effects of PHE (independent variable) on U5M and LE (dependent variables). Statistical summaries, mean distributions, cumulative frequencies, and simple linear regression analysis were the means used to test the hypotheses.

Methodology

The study occurred with OLS and included country-specific time series data from UNICEF, the WHO, and World Bank.

Variables Description and Measurement

Dependent Variables

Infants who lack protection for their well-being due to inadequate medical facilities could face obstacles to their growth and development. LE at birth is a suitable indicator of a country's health status. Therefore, this study's assumptions were that there would be a positive relationship between LE at birth and PHE and that increased PHE would correlate with lower IMR and better health status. Preventive and restorative health spending could be means of reducing the burden of disease and decreasing the years of life lost because of early death and time spent with a disease. Therefore, I expected that a higher PHE would correlate with increased LE.

Independent Variable

The Expanded Programme on Immunization by UNICEF is the most efficient public health strategy for improving child mortality worldwide.

Variable Measurement and Expected Outcomes

PHE is the determinant for resources flowing into the health sector. An assumption in this study was that PHE would positively impact LE and U5M in Cameroon. An increase in PHE per capita could result in improved access to health care services and plans, medical facilities, LE, and IMR.

Another assumption was that the redistribution and public intervention influence strategy would positively correlate with public health spending. Cameroon has 10 regions, ranging from rural suburbs to urban cities. Roberts (2003) and Baldacci (2004) indicated that geographical and demographic factors affect population growth and health outcomes due to different population distributions in rural and urban areas. Urban areas have more health care facilities and accessibility than rural areas, which lack facilities and medical personnel and have higher IMRs. Many individuals in rural areas cannot afford the high costs of medical services (Schult, 2007).

Increased per-capita incomes could correlate with better individual health. Increased income correlates with lower IMRs and increased LE as people's demand for health services increases (Nkemgha et al., 2020). In some areas of Cameroon, household incomes increases could improve access to medical services, which correlates with increased LE and decreased U5M.

Another essential assumption in this study was that increasing public health spending would correlate with increased LE at birth and decreased infant mortality. An increased PHE for better-equipped and updated health facilities could be a way to reduce the negative effects of malaria, HIV, and typhoid. However, achieving this outcome could be challenging because Cameroon's public and private health sectors continue to fall behind in technological innovations (Talla, 2014).

In contrast to the Cameroonian health care system, Baker (2011) and Moscovice and Rosenblatt (2000) recognized the United States as a country with a health care system known worldwide for efficiency and advanced medical equipment. However, many rural public health facilities lack technological advancements (CDC, 2012; WHO, 2013). Government leaders from other countries could resolve technical differences and integrate technology into rural public health departments through collaboration with the private sector by sharing information, decreasing technology, and increasing telemedicine use (CDC, 2013; Mercer, 2001).

Model Specification

The model specification in this study aligned with the literature, which indicates the path by which PHE has impacted health outcomes over time. With health outcomes as *Y* and PHE as *X*; the simple health outcome model was:

$$Yt = B0 + B1x + Ct,\ t = 1\ldots n$$

where *Yt* is health outcomes, time *t* and *x* are vectors of independent variables influencing health outcomes, *B0* is the intercept term, and *B1* is a vector coefficient of the independent variables. *Ct* is the error term assumed normally distributed with 0 mean and constant

variance. I estimated my parameters with the model. Using the aforementioned regression, I performed multiple regression with other control variables, such as HIV prevalence as an LE determinant for urban populations and PHE as a percentage of total health expenditures. Multiple regression indicates the relationship between multiple independent or predictor variables and one dependent or criterion variable. A dependent variable is a function of several independent variables with corresponding coefficients and the constant term. Multiple regression requires two or more predictor variables.

Population and Sample

The population of interest in this study was Cameroon; the focus was infant mortality and LE in Cameroon. Cameron is a low- to middle-income country in SSA with a 2020 population of 26 million. The population of interest was citizens because of the government's obligation to public health. Cameroon is an Abuja Declaration signatory, which is a commitment to allocate at least 15% of the national budget to health care. The country has different health care quality challenges, such as limited financial and human resources. The health sectors have undergone various changes over the years, and there has been an increase in PHE.

The study sample was secondary data on PHE and health outcomes between 2000–2017 in Cameroon. I used SPSS with longitudinal time-series data to answer the research questions. At the model estimation, I focused on the model summary and adjusted R^2 value because, conducting linear regression to determine which variable explained the most. I also tested the model's significance, particularly the significance of each variable in the table. Looking at the ANOVA table, I examined the coefficients of the estimated IV

parameters and measured how a unit change in IV impacted the overall model. Furthermore, I evaluated the standardized and unstandardized coefficients to illustrate this impact.

Reliability and Validity

I focused on the reliability and validity of the data collection and sampling methods and the accuracy of the information collected. Because I used a secondary data, I needed to ensure credible data sources (see O'Sullivan et al., 2017). I obtained the data from UNICEF, the WHO, and World Bank (2019), because recognized international organizations with data have been census and deemed appropriate for most studies. Consequently, this study did not have a social bias or other related data collection issues.

Ethical Considerations

Ethical issues are significant problems that researchers must consider when collecting data for qualitative or quantitative studies. This study occurred per Walden University IRB ethical guidelines as well as the necessary procedures and the permission to use data on Cameroon's PHE and health outcomes. The secondary data presented reduced risks for ethical violations and moral issues regarding the participants and informed consent, as would be required when collecting data directly from primary sources. I validated all the sources to ensure correct and reliable information.

Summary

Chapter 3 presented the study's methodology, design, and variables. U5M was the study's dependent variable because child mortality is an evolving indicator for populations.

LE at birth was another dependent variable used to measure health status and determine LE. PHE was the independent variable. I used SPSS v. 28 to perform regression analyses.

Chapter 2 included the data analysis, reliability and validity, and data collection procedures as well as discussions of the data sources and possible ethical complications or violations, which I minimized by following the Walden University IRB ethical guidelines. The study also aligned with the necessary procedures and permission to use data on Cameroon's PHE and health outcomes. After data collection, I sorted and organized the information and conducted analytic tests, I performing OLS regressions on secondary data from 2000–2017. Consequently, the quantitative quasi-experimental approach with OLS regression enabled me to provide Cameroon public health officials with policy recommendations for improving health outcomes. Chapter 4 presents the results of this analysis.

Chapter 4: Results and Analysis

Whether private or public, health care financing remains fundamental for improving individual health status. A country's GDP indicates health expenditures at the macroeconomic level. This chapter includes an analysis and discussions of the study's findings on the relationship between PHE and U5M and LE in Cameroon with quantitative data. Grossman's (1999) human capital model has four aspects regarding health demands: (a) people have limited resources that they can deploy; (b) consumption of health inputs and other positive life aspects affects OOP costs; (c) an individual's health and related margin are affected by the consumption of health inputs, such as heat, food, and health care; and (d) health is a desirable aspect of life but does not exceed other aspects in value. The theory is a useful approach for analyzing health topics. The demand for health care correlates with the rational demand, and health is an aspect of capital.

Data Analysis

The study's data analysis occurred with SPSS v. 28. SPSS software is a useful tool for handling and deciphering survey data and forecasting and predicting data trends with minimal expertise. The study had the following research questions:

RQ1: Will increased public health expenditures significantly improve both under-5 mortality and life expectancy in Cameroon?

H_01: Increased public health expenditures will significantly improve both under-5 mortality and life expectancy in Cameroon.

H_a1: Increased public health expenditures will not significantly improve both under-5 mortality and life expectancy in Cameroon.

RQ2: Can a quantitative model be developed to demonstrate the costs and benefits of an increased public health expenditures in Cameroon?

The study included data came from Fed Ousted and the World Bank, as well as 2011 CDHS data. The data included relevant information on LE, CHE, U5M, IMRs, maternal mortality, basic services, total debt, the proportion of households spending more than 10% of income or consumption on OOP health care, and net foreign direct investment. I cleaned the data by deploying codes for variables based on measurements appropriate to each case and additional elements related to data quality, including missing data that presented complications to data analysis. I deleted data from 1960–1999 and 2019–2020.

After cleaning the data, I began analysis by describing the study population with descriptive statistics. Descriptive statistics enable researchers to present data in a summary so readers can understand measurements and samples, commonly displayed as spread and central tendency. Spread is a measure of data dispersion, including standard deviation, variance, absolute deviation, quartiles, and range; central tendency includes frequency data distribution and mean, median, and mode. Researchers use frequency distributions for categorical variables while deploying standard deviation and means for continuous variables. I provided descriptive statistics for the independent and dependent variables to characterize the study population.

Inferential statistics were the means used to determine correlations between the variables. My goal was to make inferences about the study population with data from the sample. I made predictions and compared data while identifying the chances of the occurrence of the study phenomenon. A multiple regression model for statistical testing

occurred with the study's independent and dependent variables. Multiple regression is a useful way of predicting a variable's value based on the value of two or more variables. I conducted multiple regression to determine the model's variance or the overall fit and understand all predictors' relative contributions to overall variance:

$$Yt = B0 + B1x + Ct, t = 1…n$$

In this series, *Yt* was health outcomes, *t* was time, and *x* was a vector of the independent variables influencing health outcomes. *B0* was the intercept term, *B1* was the regression coefficient of the independent variables, and *Ct* was the error term with an assumed normal distribution with the mean and constant variance.

Multiple regression includes the assumption that there is a linear relationship between the dependent variable and each independent variable (Ngo & La Puente, 2012). Also assumed is that the error number of residuals remains the same at all points in the model. A scatterplot can indicate if there is a linear relationship between measured variables, and researchers can measure the error number of residuals with scatterplots to identify homoscedasticity. The assessment further includes an independent measurement of observations that scholars can check with the Durbin-Watson statistic. Finally, the approach includes the assumption of normal residual distribution, allowing scholars to test multivariate normality with the normal probability plot method. Regression analysis indicates the correlations between variables simultaneously. I quantified the relationship between U5M, LE, and PHE while considering other issues such as maternal mortality, HIV incidence, basic drinking water services, total debt, and foreign direct investment. Regression analysis was appropriate for this study.

The study included country-specific time series data from UNICEF, WHO, and World Bank. I selected the data collection time frame because of the 2001 Abuja Declaration of 2001, which required WHO members to allocate at least 15% of their annual budgets to health care, the MDG objective to alleviate poverty and improve child health, and the Addis Ababa Declaration on the relationship between poverty and health care provision. Cameroon had a population of 26.5 million in 2020 (World Bank, 2022).

Results

Descriptive Statistics

I sought to meet the study's objectives with an inferential statistics analysis of the relationship between various variables.

Overview of Health Expenditure in Cameroon

I first examined the general health expenditure, the allocation percentage, and the government budget for the health sector in Cameroon. I developed a graphical presentation of general trends in public health spending in Cameroon by observing two main public health statistics: public health spending as a proportion of GDP and public health spending from foreign aid. In general, the PHE as a proportion of GDP remained at an average of 3.91% between 2000 and 2019. Meanwhile, PHE from foreign aid averaged 7.89%, increasing from a low of 1.86% in the early 2000s to a high of 19.35% in 2019 (see Table 1).

Table 1

Descriptive Statistics for Public *Expenditure in Cameroon*

Variable	*M*	*SD*	*Min*	*Mdn*	*Max*
Health expenditures (% of GDP)	3.9118	0.2480	3.4651	3.9553	4.2976
External health expenditure per head	7.89	4.83	1.86	7.11	19.35

Public Health Spending as a Proportion of GDP in Cameroon

Figure 4 shows that public health spending as a proportion of GDP has declined over 20 years. The highest PHE as a proportion of GDP occurred in the early 2000s, with levels over 4.2%. Over time, this proportion decreased to the 3.4%–3.6% range between 2017 and 2019 (see Figure 5).

Figure 4

Public Health Spending as a Proportion of GDP

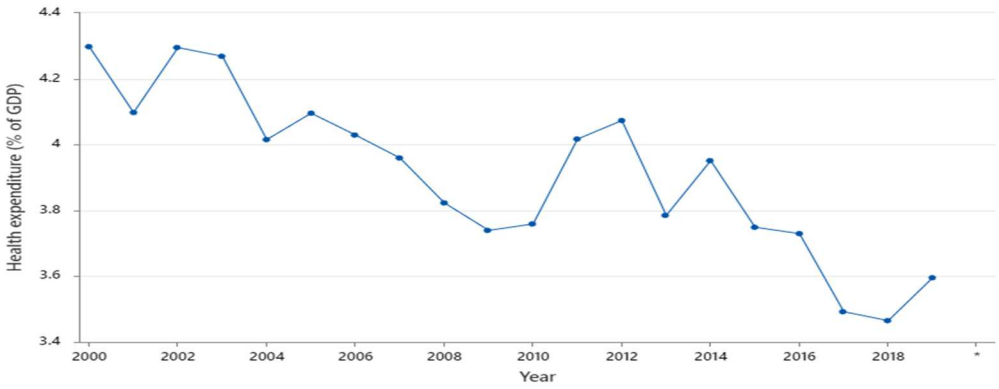
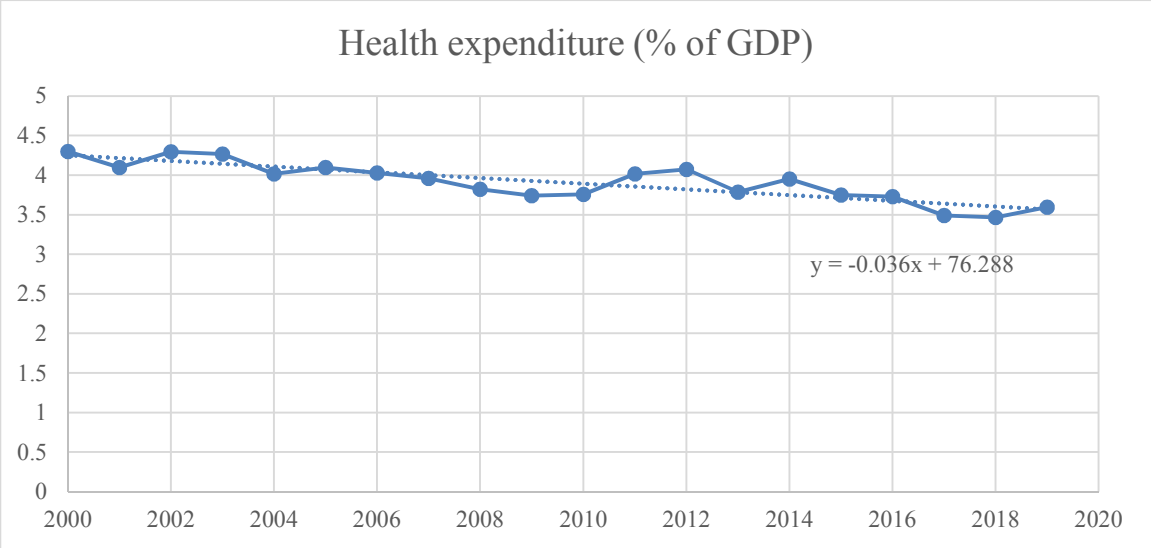


Figure 5

Public Health Spending as a Percentage of GDP

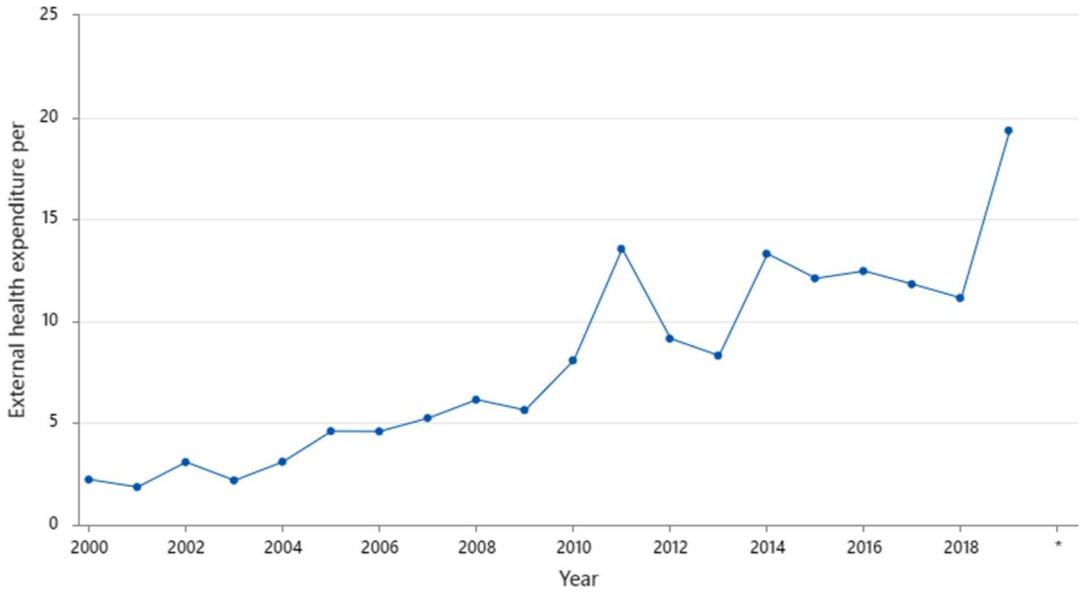


Public Health Expenditures as a Proportion of Foreign Aid

Public health spending from foreign donors increased over time from below 2% in the early 2000s to nearly 20% in 2019. This finding indicates increased public health spending from foreign sources over time and a corresponding decline in domestic spending. The increase in foreign aid could have significantly and positively impacted health outcomes in Cameroon; however, this was not the case (see Figure 6).

Figure 6

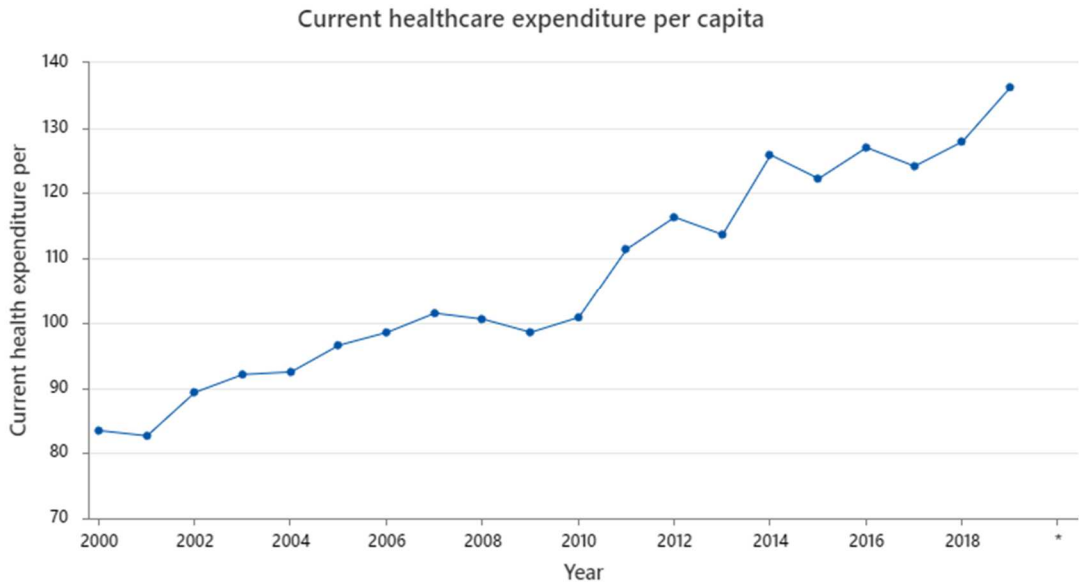
Public Health Spending as a Proportion of Foreign Aid



For absolute value, PHE data showed that Cameroon had increased public health investment. Figure 7 shows that current dollar expenditures per capita increased from $86 in the early 2000s to over $136 at the end of 2019. The dollar value per capita spending provided a realistic perspective of actual spending on public health, while the expenditure proportionates to GDP showed how public health spending compared to economic growth. The current PHE was the primary measure for the regressions tested in this study.

Figure 7

Current Expenditure for the Cameroonian Public Health Sector Per Head



Health Expenditures and Under-5 Mortality

Next, I evaluated the relationship between U5M and the PHE in Cameroon. A moderately strong model fit showed a statistically significant relationship between the PHE and U5M in the country. The PHE had a positive coefficient, indicating that a higher PHE correlates with lower U5M. I verified this finding by including additional factors in the model, as shown in Tables 2–4.

Table 2

Relationship Between Public Health Expenditures and Under-5 Mortality – Model Summary

Model	*R*	R^2	Adjusted R^2	*SE*
1	.851[a]	.724	.709	12.48073180000000

a. Predictors: (Constant), health expenditure (% of GDP)

Table 3

Relationship Between Public Health Expenditures and Under-5 Mortality – ANOVA[a]

Model		*SS*	*df*	*MS*	*F*	*Sig*
1	Regression	6861.993	1	6861.993	47.273	.000[b]
	Residual	2612.809	18	145.156		
	Total	9474.802	19			

a. Dependent variable: Mortality rate, under-5 (per 1,000 live births)
b. Predictors: (Constant), health expenditure (% of GDP)

Table 4

Relationship Between Public Health Expenditures and Under-5 Mortality – Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficients	*t*
		B	*SE*	*B*	
1	(Constant)				
	Health expenditure (% of GDP)				

a. Dependent variable: Mortality rate, under-5 (per 1,000 live births)

I included additional factors in the model in the second test with U5M as the dependent variable. The purpose of the second model was to evaluate the factors historically associated with U5M and their significance for the Cameroon population. Tables 5–7 show the significant factors after a stepwise regression test. Overall, I added these factors to improve the model fit for the regression equation by providing an adjusted *R*-squared value of 1. I identified several predictors as significant, including LE at birth, HIV incidence, maternal mortality, malaria incidence, and basic sanitation.

Table 5

Relationship Between Under-5 Mortality and Other Public Health Factors – Model Summary

Model	*R*	R^2	Adjusted R^2	*SE*
1	1.000[a]	1.000	1.000	.137937853000000

a. Predictors: (Constant), GDP (current $US), Immunization, DPT (% of children ages 12-23 months), Incidence of malaria (per 1,000 population at risk), Current health expenditure per capita, PPP (current international $), Maternal mortality ratio (modeled estimate, per 100,000 live births), Immunization, measles (% of children ages 12-23 months), People using at least basic sanitation services (% of population), Incidence of HIV, all (per 1,000 uninfected population), Life expectancy at birth, total (years)

Table 6

Relationship Between Under-5 Mortality and Other Public Health Factors – ANOVA[a]

Model		*SS*	*df*	*MS*	*F*	*Sig*
1	Regression	6882.699	9	764.744	40192.89	.000[b]
	Residual	.152	8	.019		
	Total	6882.851	17			

a. Dependent variable: Mortality rate, under-5 (per 1,000 live births)
b. Predictors: (Constant), GDP (current $US), Immunization, DPT (% of children ages 12-23 months), Incidence of malaria (per 1,000 population at risk), Current health expenditure per capita, PPP (current international $), Maternal mortality ratio (modeled estimate, per 100,000 live births), Immunization, measles (% of children ages 12-23 months), People using at least basic sanitation services (% of population), Incidence of HIV, all (per 1,000 uninfected population), Life expectancy at birth, total (years)

Table 7

Relationship Between Under-5 Mortality and Other Public Health Factors – Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficients	*t*
		B	*SE*	*B*	
1	(Constant)	561.056	21.820		25.713
	Current health expenditure per capital, PPP (current international $)	-.020	.013	-.014	-1.558
	Immunization, measles (% of children ages 12-23 months)	.028	.022	.015	1.282
	Immunization, DPT (% of children ages 12-23 months)	-.014	.027	-.005	-.519
	Incidence of HIV, all (per 1,000 uninfected population)	6.136	.863	.307	7.107
	Life expectancy at birth, total (years)	-11.063	.910	-1.347	-12.160
	Maternal mortality ratio (modeled estimate, per 100,000 live births)	-.034	.003	-.184	-10.515
	Incidence of malaria (per 1,000 population at risk)	-.016	.002	-.061	-9.439
	People using at least basic sanitation services (% of population)	4.236	.815	.414	5.200

a. Dependent variable: Mortality rate, under-5 (per 1,000 live births)

Health Expenditures and Life Expectancy

LE was the second outcome variable selected for this study. An overview of the variable showed an average LE of 54.96 over 19 years. There was a range from 50.9 in the early 2000s to 59.2 toward the end of the observation period. Overall, the LE of people in Cameroon increased by almost 10 years between 2000 and 2019 (see Table 8 and Figure 8).

Table 8

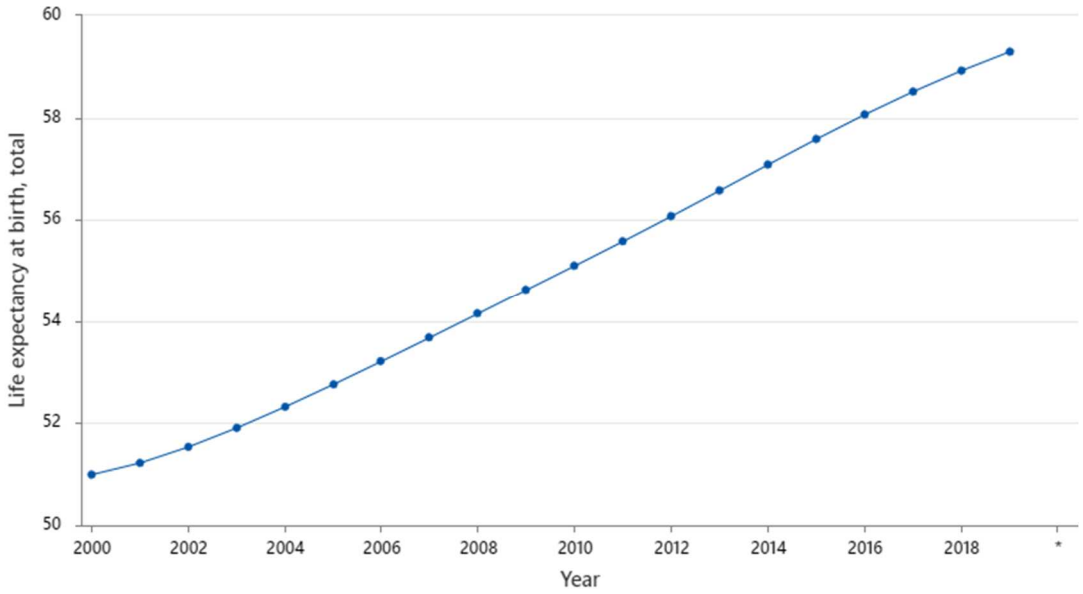
Descriptive Statistics for Life Expectancy in Cameroon

Variable	*M*	*SD*	*Min*	*Mdn*	*Max*
Life expectancy at birth, total	54.960	2.718	50.993	54.864	59.292

Source: Minitab

Figure 8

Trends in Life Expectancy in Cameroon



The findings showed a relationship between the PHE and LE in Cameroon between 2000 and 2019. Tables 9–11 show a strong model fit for this relationship, as the independent variable had a statistically significant relationship with the outcome variable. A higher PHE significantly correlated with longer LE among people in Cameroon.

Table 9

Relationship Between Public Health Expenditure and Life Expectancy – Model Summary

Model	*R*	R^2	Adjusted R^2	*SE*
1	.977[a]	.955	.953	.590617260000000

a. Predictors: (Constant), current health expenditure per capita, PPP (current international $)

Table 10

Relationship Between Public Health Expenditure and Life Expectancy – ANOVA[a]

Model		*SS*	*df*	*MS*	*F*	*Sig*
1	Regression	134.054	1	134.054	384.296	.000[b]
	Residual	6.279	18	.349		
	Total	140.332	19			

a. Dependent variable: Life expectancy at birth, total (years)
b. Predictors: (Constant), current health expenditure per capita, PPP (current international $)

Table 11

Relationship Between Public Health Expenditure and Life Expectancy – Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficients	*t*
		B	*SE*	*B*	
1	(Constant)	37.403	.905		41.316
	Current health expenditure per capita, PPP (current international $)	.164	.008	.977	19.603

a. Dependent variable: Life expectancy at birth, total (years)

I added several other predictors to the model to determine the variables influencing LE among the Cameroon population. Model 9, the most significant model, included several variables. The significant predictors were basic sanitation services, mortality rate, malaria and HIV incidence, and maternal mortality. As expected, maternal mortality, U5M, and malaria incidence correlated with lower LE, while sanitation and HIV incidence correlated with higher LE (see Tables 12–14).

Table 12

Relationship Between Life Expectancy and Other Public Health Factors – Model Summary

Model	*R*	R^2	Adjusted R^2	*SE*
9	1.000[i]	1.000	1.000	.011619419300000

i. Predictors: (Constant), People using at least basic sanitation services (% of population), Mortality rate, under-5 (per 1,000 live births), Incidence of malaria (per 1,000 population at risk), Maternal mortality ratio (modeled estimate, per 100,000 live births), Incidence of HIV, all (per 1,000 uninfected population)

Table 13

Relationship Between Life Expectancy and Other Public Health Factors – ANOVA[a]

Model		*SS*	*df*	*MS*	*F*	*Sig*
9	Regression	102.054	5	20.411	151179.438	.000[j]
	Residual	.002	12	.000		
	Total	102.056	17			

a. Dependent variable: Life expectancy at birth, total (years)

j. Predictors: (Constant), People using at least basic sanitation services (% of population), Mortality rate, under-5 (per 1,000 live births), Incidence of malaria (per 1,000 population at risk), Maternal mortality ratio (modeled estimate, per 100,000 live births), Incidence of HIV, all (per 1,000 uninfected population)

Table 14

Relationship Between Life Expectancy and Other Public Health Factors – Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficients	*t*
		B	*SE*	*B*	
9	(Constant)	47.073	1.720		27.362
	People using at least basic sanitation services (% of population)	.446	.031	.358	14.587
	Mortality rate, under-5 (per 1,000 live births)	-.079	.004	-.651	-20.491
	Incidence of malaria (per 1,000 population at risk)	-.001	.000	-.045	-10.809
	Maternal mortality ratio (modeled estimate, per 100,000 live births)	-.003	.000	-.129	-8.988
	Incidence of HIV, all (per 1,000 uninfected population)	.422	.066	.173	6.359

a. Dependent variable: Life expectancy at birth, total (years)

Health Expenditures and Maternal Mortality

I evaluated the relationship between PHE and maternal mortality, which is the number of mothers who die during childbirth. The regression results showed a good model fit for these two variables at .803. Moreover, there was a statistically significant relationship between public health spending and maternal mortality. Higher spending correlated with lower maternal mortality in Cameroon (see Tables 15–17).

Table 15

Relationship Between Maternal Mortality and Public Health Expenditure Types – Model Summary

Model	*R*	R^2	Adjusted R^2	*SE*
1	.896[a]	.803	.791	50.209

a. Predictors: (Constant), Current health expenditure per capita, PPP (current international $)

Table 16

Relationship Between Maternal Mortality and Public Health Expenditure Types – ANOVA[a]

Model		*SS*	*df*	*MS*	*F*	*Sig*
1	Regression	164679.477	1	164679.477	65.325	.000[b]
	Residual	40335.023	16	2520.939		
	Total	205014.500	17			

a. Dependent variable: Maternal mortality ratio (modeled estimate, per 100,000 live births)
j. Predictors: (Constant), Current health expenditure per capita, PPP (current international $)

Table 17

Relationship Between Maternal Mortality and Public Health Expenditure Types – Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficients	*t*
		B	*SE*	*B*	
9	(Constant)	1362.921	88.568		15.388
	Current health expenditure per capita, PPP (current international $)	-6.804	.842	-.896	-8.082

a. Dependent variable: Maternal mortality ratio (modeled estimate, per 100,000 live births)

Health Expenditures, HIV/AIDS Prevalence, and Under-5 Mortality

I evaluated the impact of health expenditures and HIV prevalence against U5M. Although the results showed that PHE correlated with lower U5M, this regression focused on how HIV prevalence impacted this relationship. The stepwise regression showed that both variables were statistically significant predictors of U5M. HIV incidence correlated with higher mortality, while PHE correlated with lower mortality. The impact of PHE diminished with the addition of HIV prevalence to the model. Tables 18–20 present the findings.

Table 18

Relationship Between Public Health Expenditure, HIV Prevalence, and Under-5 Mortality – Model Summary

Model	*R*	R^2	Adjusted R^2	*SE*
1	.991a	.983	.981	3.110340946000000

a. Predictors: (Constant), Incidence of HIV, all (per 1,000 uninfected population), Current health expenditure per capita, PPP (current international $)

Table 19

Relationship Between Public Health Expenditure, HIV Prevalence, and Under-5 Mortality – ANOVA[a]

Model		*SS*	*df*	*MS*	*F*	*Sig*
1	Regression	164679.477	1	164679.477	65.325	.000[b]
	Residual	40335.023	16	2520.939		
	Total	205014.500	17			

a. Dependent variable: Mortality rate, under-5 (per 1,000 live births)
b. Predictors: (Constant), Incidence of HIV, all (per 1,000 uninfected population), Current health expenditure per capita, PPP (current international $)

Table 20

Relationship Between Public Health Expenditure, HIV Prevalence, and Under-5 Mortality – Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficients	*t*
		B	*SE*	*B*	
1	(Constant)	161.285	21.014		7.675
	Current health expenditure per capita, PPP (current international $)	-.684	.153	-.496	-4.483
	Incidence of HIV, all (per 1,000 uninfected population)	10.657	2.331	.506	4.572

a. Dependent variable: Mortality rate, under-5 (per 1,000 live births)

Health Expenditures, HIV/AIDS Prevalence, and Life Expectancy

This test focused on the impact of the PHE and HIV prevalence on LE. Again, the test showed a relationship between the PHE and LE. However, I also investigated whether HIV prevalence influenced this outcome. The regression had a strong model fit outcome of .98, and HIV incidence and PHE had statistical significance. HIV incidence correlated with lower LE, whereas PHE correlated with improved LE. PHE impact diminished with the addition of HIV prevalence in the model (see Tables 21–23).

Table 21

Relationship Between Public Health Expenditure, HIV Prevalence, and Life Expectancy – Model Summary

Model	*R*	R^2	Adjusted R^2	*SE*
1	.990a	.980	.978	.403001473000000

a. Predictors: (Constant), Incidence of HIV, all (per 1,000 uninfected population), Current health expenditure per capita, PPP (current international $)

Table 22

Relationship Between Public Health Expenditure, HIV Prevalence, and Life Expectancy – ANOVA[a]

Model		*SS*	*df*	*MS*	*F*	*Sig*
1	Regression	137.572	2	68.786	423.531	.000b
	Residual	2.761	17	.162		
	Total	140.332	19			

a. Dependent variable: Life expectancy at birth, total (years)
b. Predictors: (Constant), Incidence of HIV, all (per 1,000 uninfected population), Current health expenditure per capita, PPP (current international $)

Table 23

Relationship Between Public Health Expenditure, HIV Prevalence, and Life Expectancy – Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficients	*t*
		B	*SE*	*B*	
1	(Constant)	49.745	2.723		18.270
	Current health expenditure per capita, PPP (current international $)	.076	.020	.452	3.840
	Incidence of HIV, all (per 1,000 uninfected population)	-1.406	.302	-.548	-4.654

a. Dependent variable: Life expectancy at birth, total (years)

Health Expenditures, Malaria, and Under-5 Mortality

The study also addressed the impact of PHE and malaria prevalence on U5M. The test found a relationship between PHE and U5M; however, I also investigated whether malaria incidence impacted the outcome variable. The regression had a strong model fit of .971. Furthermore, both predictors have reached statistical significance at the 95% test statistic. PHE correlated with positive U5M outcomes, while malaria prevalence correlated with adverse U5M outcomes (see Tables 24–26).

Table 24

Relationship Between Public Health Expenditure, Malaria Incidence, and Life Expectancy – Model Summary

Model	*R*	R^2	Adjusted R^2	*SE*
1	.987[a]	.974	.971	.466002338000000

a. Predictors: (Constant), Incidence of malaria (per 1,000 population at risk), Current health expenditure per capita, PPP (current international $)

Table 25

Relationship Between Public Health Expenditure, Malaria Incidence, and Life Expectancy – ANOVA[a]

Model		*SS*	*df*	*MS*	*F*	*Sig*
1	Regression	136.641	2	68.320	314.611	.000[b]
	Residual	3.692	17	.217		
	Total	140.332	19			

a. Dependent variable: Life expectancy at birth, total (years)

b. Predictors: (Constant), Incidence of malaria (per 1,000 population at risk), Current health expenditure per capita, PPP (current international $)

Table 26

Relationship Between Public Health Expenditure, Malaria Incidence, and Life Expectancy – Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficients	*t*
		B	*SE*	*B*	
1	(Constant)	45.243	2.381		19.001
	Current health expenditure per capita, PPP (current international $)	.122	.014	.728	8.838
	Incidence of malaria (per 1,000 population at risk)	-.010	.003	-.284	-3.452

a. Dependent variable: Life expectancy at birth, total (years)

Health Expenditures, Sanitization, and Under-5 Mortality

I evaluated the impact of PHE and basic sanitation on U5M. The regression equation showed a strong line fit of .997, and both predictors were highly significant at the 95% level. Basic sanitation services and higher PHE correlated with lower U5M (see Tables 27–29).

Table 27

Relationship Between Public Health Expenditure, Basic Sanitization Use, and Under-5 Mortality – Model Summary

Model	*R*	R^2	Adjusted R^2	*SE*
1	.999[a]	.997	.997	1.276296954000000

a. Predictors: (Constant), People using at least basic sanitation services (% of population), Current health expenditure per capita, PPP (current international $)

Table 28

Relationship Between Public Health Expenditure, Basic Sanitization Use, and Under-5 Mortality – ANOVA[a]

Model		*SS*	*df*	*MS*	*F*	*Sig*
1	Regression	9447.110	2	4723.555	2899.783	.000[b]
	Residual	27.692	17	1.629		
	Total	9474.802	19			

a. Dependent variable: Mortality rate, under-5 (per 1,000 live births)
b. Predictors: (Constant), People using at least basic sanitation services (% of population), Current health expenditure per capita, PPP (current international $)

Table 29

Relationship Between Public Health Expenditure, Basic Sanitization Use, and Under-5 Mortality – Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficients	*t*
		B	*SE*	*B*	
1	(Constant)	484.395	16.033		30.213
	Current health expenditure per capita, PPP (current international $)	-.186	.083	-.135	-2.243
	People using at least basic sanitation services (% of population)	-8.746	.606	-.867	-14.425

a. Dependent variable: Mortality rate, under-5 (per 1,000 live births)

Health Expenditures, Immunizations, and Under-5 Mortality

Finally, the study addressed the impact of the PHE and immunization on U5M. The two immunizations with available data for Cameroon were measles and diphtheria, tetanus, and acellular pertussis (DTP), which infants at least 12 months old can receive. None of the immunizations were significant predictors of U5M. Nevertheless, greater public health spending correlated with lower U5M, as indicated in the results section (see Tables 30–32).

Table 30

Relationship Between Public Health Expenditure, Immunization, and Under-5 Mortality – Model Summary

Model	*R*	R^2	Adjusted R^2	*SE*
1	.982[a]	.964	.957	4.639020934000000

a. Predictors: (Constant), Immunization, DPT (% of children ages 12-23 months), Current health expenditure per capita, PPP (current international $), Immunization, measles (% of children ages 12-23 months)

Table 31

Relationship Between Public Health Expenditure, Immunization, and Under-5 Mortality – ANOVA[a]

Model		*SS*	*df*	*MS*	*F*	*Sig*
1	Regression	9130.474	3	3043.491	141.423	.000[b]
	Residual	344.328	16	21.521		
	Total	9474.802	19			

a. Dependent variable: Mortality rate, under-5 (per 1,000 live births)
b. Predictors: (Constant), Immunization, DPT (% of children ages 12-23 months), Current health expenditure per capita, PPP (current international $), Immunization, measles (% of children ages 12-23 months)

Table 32

Relationship Between Public Health Expenditure, Immunization, and Under-5 Mortality – Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficients	*t*
		B	*SE*	*B*	
1	(Constant)	236.768	24.925		9.499
	Current health expenditure per capita, PPP (current international $)	-1.287	.092	-.933	-13.980
	Immunization, measles (% of children ages 12-23 months)	-.580	.606	-.271	-.957
	Immunization, DPT (% of children ages 12-23 months)	.667	.759	.238	.878

a. Dependent variable: Mortality rate, under-5 (per 1,000 live births)

Testing Hypotheses

Data analysis showed that PHE had a statistically significant impact on U5M. Specifically, Table 1 showed that the PHE correlated with better U5M outcomes. The same results emerged across the remaining four tables; consequently, I found sufficient evidence to reject the first null hypothesis. Indeed, the study showed that a higher PHE correlated with improved U5M. I also evaluated the impact of PHE on LE in Cameroon with regression tests. Tables 5–7 showed the statistically significant and positive impact of PHE on LE in Cameroon, and Tables 17–19 showed that the impact remained statistically significant despite HIV prevalence. Consequently, I found sufficient evidence to reject the second null hypothesis and accept the alternate hypothesis in full. The results showed an increased PHE correlated with improved U5M and LE in Cameroon.

Summary

This chapter addressed the public health spending data and other key health data from Cameroon to address U5M and LE determinants. Through extensive testing, the results showed that PHE correlated with improved U5M and LE. These benefits occurred regardless of disease prevalence, including HIV and malaria. Nevertheless, disease presence dampened the positive effects of public health spending. Basic sanitization also associated with lower U5M; however, immunization for children over 12 months did not impact U5M. Moreover, PHE correlated with lower maternal mortality. Chapter 5 presents a discussion of these results.

Chapter 5: Discussion, Implications, Recommendations, and Conclusion

This chapter presents the findings in the context of the research problem and the literature. Subsequently, there are policy implications and recommendations. The chapter ends with a conclusion and summary.

Discussion

The purpose of this study was to examine how PHE impacts health outcomes in Cameroon. Increased PHE correlate with improved health outcomes and other socioeconomic benefits. For instance, PHE directly and indirectly contributes to economic performance indicators such as GDP (Bedir, 2016; Öztürk & Topçu, 2014; Raghupathi & Raghupathi, 2020). Health care is an important predictor of human capital quality. Improved public health results in higher productivity and human capital, contributing to economic growth (Piabuo & Tieguhong, 2017). This research focused on PHE and conditions that positively contribute to health outcomes and, by extension, economic development. Consequently, this study addressed how PHE in Cameroon affected health outcomes among at-risk populations.

The study included the key health indicators of disease prevalence, maternal mortality, LE, U5M, and basic sanitation. Maternal mortality is one of the eight MDGs adopted in 2000 in 189 countries, and the fifth is securing maternal health care. Maternal mortality is an important health care outcome with a targeted reduction of 75% across UN countries (UN, n.d.). Maternal mortality is also a major health care problem in developing countries in Africa and Asia. Scholars have investigated the impact of health care policies and local governmental preventive strategies. Similarly, U5M is an unacceptably high

health outcome in SSA, with at least 40% of under-5 deaths occurring in the region (Adedini et al., 2015). Studies on this phenomenon have shown significant relationships between individual- and state-level characteristics and child mortality. Living in socioeconomically deprived communities or neighborhoods correlates with increased U5M risk. Thus, this study produced outcomes relevant to public health discourse on the predominant health indicators in SSA.

The study had significant results regarding public health spending and improved health outcomes. Higher PHE correlated with lower U5M and higher LE. Welfare economics is a social and economic welfare branch that focuses on resource allocation in an economy among social agents (Andrade et al., 2018). For this study, resource allocation included the PHE and its influence on socioeconomic welfare. Wang (2015) found that, on average, health expenditures in target countries increased three times faster than GDP growth. Higher incomes positively influence health outcomes, while inadequate healthcare delivery correlates with negative socioeconomic outcomes. Greater PHE correlates with improved public health outcomes. Keats et al. (2018) reported a 44% reduction in U5M after a quadrupled PHE and external aid for children's health between 2003 and 2014 in Kenya. Similarly, Al-Azri et al. (2020) found that an increased PHE affected infant mortality and U5M.

This study contributed to other research on PHE's differential impacts in different countries. There is a bidirectional causality relationship between PHE and LE (Nkemgha et al., 2021). This study found that PHE positively impacted LE and U5M despite adverse health factors such as HIV and malaria. Bor et al. (2013) explored the impact of public

health spending on HIV treatments and found an 11.3-year LE increase after an investment in HIV antiretroviral treatments in rural South Africa. Investment in public health systems is a cost-effective approach to improving LE outcomes within a population. Nevertheless, SSA has higher-than-average health care expenditures due to greater spending on antiretroviral drugs and HIV treatments to manage the epidemic (Nketiah-Amponsah, 2019), which perhaps explains why the effect is dampened and not reversed. This study also found that an increased PHE correlated with lower malaria incidence and indirectly and positively affected LE. Overall, PHE correlated with increased LE and lower disease incidence.

Another key finding was that basic sanitation affected U5M outcomes. Like other studies, this research found lower U5M with increased access to clean water and sanitation. In a global study with data from 193 countries, Cheng et al. (2012) found that U5M decreased by 1.66 deaths per 1,000 people for every quartile increase in sanitation access. Similarly, Waziri et al. (2018) found that limited water and sanitation access significantly and negatively correlated to U5M in developing countries. In Dharod et al.'s (2021) study, inadequate access to basic sanitation and clean water correlated with higher diarrhea risk among children in Cameroon. By extension, children faced a higher U5M risk because diarrhea is a leading cause of infant mortality and U5M. Overall, the present study showed the impact of sanitation on U5M.

This study's findings also supported the hypotheses. I rejected the null hypothesis due to finding a statistically significant relationship between the PHE and improved U5M

and LE in Cameroon. The findings showed the relationships across varying socioeconomic environments, which aligned with the literature.

Policy Implications and Recommendations

This study's findings could contribute to policymaking and social change in Cameroon. This study indicates the need for a personal and institutional drive to implement effective policy changes through higher learning systems. For example, Walden University (2022) promotes a vision of "a diverse community of professionals [who transform themselves to] affect positive social change." In this context, social change is the deliberate process through which individuals create ideas, strategies, and actions to promote societal and individual development (Walden University, 2020). Consequently, this study could have policy implications for improving health systems and increasing PHE in Cameroon to improve the general development and dignity of the people in Cameroon.

This study's findings could also indicate how to optimize PHE in Cameroon. Data analysis showed that a higher PHE per capita correlated with lower maternal mortality, lower U5M, and higher LE. The trends between the PHE and life LE shifted. Whereas previous data showed no relationship or a negative relationship in SSA, this study found an increased PHE correlated with increased LE. Quality rather than quantity in public health spending could be a way to increase LE in developing countries (Deshpande et al., 2014). Government leaders in Cameroon could evaluate this relationship to reshape public health perspectives on how health care spending impacts LE. Moreover, Cameroon government leaders in should continue committing to public health spending to improve maternal and child health outcomes in the country. In addition to matching spending to

other well-performing countries, the country's leaders must also have a critical framework for determining and optimizing quality metrics for health care spending. Many developing countries have had an increase in PHE over the past 3 decades yet not had returns on key health outcomes, such as LE. Cameroon government officials should establish effectiveness and optimization metrics, benchmark successful countries, and improve health care system efficacy to maximize PHE's benefits for LE.

The study showed that sanitation positively and significantly impacted U5M, a relationship also found in local and international research. This finding indicates that government leaders in Cameroon should increase their efforts to provide clean water and sanitation to improve people's health. For example, government officials could improve basic sanitation across the country by extending projects such as the Yaoundé City Sustainable Enhanced Drainage and Sanitation Project to improve sanitation by building canals and drainage systems. Public health officials should also advocate for greater investments in such programs to work toward the collective improvement of health in the country.

Finally, the study showed that HIV and malaria dampen PHE's positive impact on key health outcomes. HIV and malaria are epidemics disproportionately affecting developing countries, particularly in SSA (Mohanty & Behera, 2020; Nketiah-Amponsah, 2019). Despite evidence that the leaders of highly affected countries have invested more in HIV treatment (Nketiah-Amponsah, 2019), there should be a greater emphasis on preventive and eradication efforts. A significant portion of PHE focuses on preventable disease treatment. Investing in the continuous development of public health knowledge and

systems in Cameroon could contribute to improved health and lower susceptibility to preventable diseases, including chronic ones. Government leaders should develop a public health strategic plan to address preventable diseases through decisive actions, such as advocacy, health education, and investment in medical research on malaria and HIV to improve population health.

Study Limitations and Areas of Future Study

A limitation of this study is data accessibility issues. The health outcomes data from the early 1990s had fewer observations for Cameroon than other countries. This limitation could have influenced the data interpretation, and results could vary in other studies. Therefore, I recommend further research into the relationship between the PHE and LE in Cameroon. Unlike other developing countries, Cameroon showed a positive and significant relationship between PHE, U5M, and LE; therefore, scholars should study this relationship. Cameroon's data could provide insight to other developing countries on how to improve LE.

Because there are no existing theories on the impact of government health expenditure on health outcomes, the study could not review any theory related to government expenditure and health outcomes. But, a number of extant studies, which are not many, were reviewed on the impact of public health expenditure on health outcome. It is found in the study that public expenditure on health has a positive impact on infant mortality rate, per capita and which could possibly create more improvement in the economy of Cameroon.

The study equally used Cameroon specific data from WDI to carry out a simple linear regression. It might have been better to carry out a non-linear, multiple regression study to learn more about each variable's behavior. This study was based solely on specific selected health outcomes (LE and U5M). furthermore, if total monetary governance were included, it might have shown a greater impact since corruption was not captured here, which is an important variable to be taken into consideration.

Conclusion

This chapter presented the findings in relation to the literature and theoretical frameworks. I interpreted the findings through the lens of welfare economics and compared them to extant studies. These findings could have policy implications for the government in Cameroon, including sustained PHE growth, strategic planning for public health interventions for preventable diseases such as malaria and HIV, and upscaled efforts to improve access to clean water and basic sanitation. This chapter also presented the limitations of data access in this study. I recommend future research to challenge or support this study's findings and the literature.

Based on other related findings that the government spending on health has an impact on health outcome (Under-five mortality rate) in the West Africa Sub-region, it is recommended that the government should continue to increase spending on the health sector, particularly spending on programmes that have a direct bearing on infant mortality rate as a health outcome.

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