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Patient out-of-pocket expenditure in primary care comparing high income, middle income and low-income countries

Anwar Alrashed MD
BSc, MBBS, KBFM, MRCGP. (Int.) MSc
Corresponding author email: alrashed@doctor.com

Hany Ramadan Mohamed
MBBS, MRCGP (Int.)

***Abstract*---Background:** Out-of-pocket health expenditures (OOPHE) in primary care can pose a significant financial burden on individuals and households, particularly in low- and middle-income countries. Understanding the factors influencing OOPHE is crucial for developing effective policies to improve healthcare access and affordability. **Objective:** This systematic review aimed to identify and analyze the factors influencing OOPHE in primary care settings across high-, middle-, and low-income countries. **Methods:** A comprehensive search of electronic databases was conducted to identify relevant studies. Included studies were assessed for quality and data were extracted to identify key factors influencing OOPHE. **Results:** Demographic characteristics, socioeconomic factors, healthcare utilization, system factors, and cultural factors were all found to influence OOPHE. Lower income levels, limited insurance coverage, frequent healthcare utilization, and higher disease severity were consistently associated with higher OOP costs. **Conclusion:** The findings highlight the significant burden of OOP expenditures on individuals and households. Policymakers should prioritize strategies to expand health insurance coverage, improve access to primary care services, negotiate lower prices for healthcare goods, and address underlying socioeconomic factors. Further research is needed to explore the impact of specific interventions and the role of cultural factors in shaping OOP expenditures.

***Keywords*---**OOPHE, Demographic characteristics, healthcare.

Introduction

Out-of-pocket health expenditure (OOPHE) is defined as household spending incurred when using a service to obtain any type of health care (Promotive, preventive, curative, rehabilitative, palliative, or long-term) (1). Achieving universal health coverage (UHC) in under-resourced health systems is challenging. In many low-income countries, households rely heavily on out-of-pocket payments, which can lead to catastrophic expenditures for accessing primary and other types of care. (2–4). According to the World Health Organization (5,6), out-of-pocket health expenses can create significant financial hardship, forcing individuals and households to deplete savings, borrow money, or even sell assets to cover medical bills. This can lead to poverty, food insecurity, and other negative social and economic consequences. Universal health coverage (UHC) requires governments to allocate adequate resources for health, reduce financial barriers, and ensure efficient use of resources. In many low-income countries, out-of-pocket payments are a significant source of health financing. (7). Paying too much out of pocket can make it more difficult for people to get the care they need because it discourages them from obtaining essential medical attention. (8,9). Furthermore, households' overall welfare is negatively impacted by out-of-pocket healthcare expenses. (9). Brown et al. (8) Discovered that poorer households were less likely to face catastrophic out-of-pocket payments because they postponed or avoided necessary medical care. Seeberg et al.'s (10) Data, on the other hand, suggests that low-income households may have incurred catastrophic out-of-pocket costs because they sought care from fewer qualified providers. Another study by Ku et al. (11), carried out in Taiwan, suggested that the National Health Insurance program's introduction in 1995 helped lower out-of-pocket medical expenses, particularly for low-income households. Numerous research studies have been conducted to examine the effects of out-of-pocket health spending on the degree of poverty among communities. (12–16). Research has shown that compared to less impoverished groups, those in poverty are more likely to seek no treatment at all or care for themselves at a lesser standard. (8,10).

The World Health Organization defines catastrophic out-of-pocket health spending as direct out-of-pocket payments (OOP) that are greater than 40% of household income less subsistence needs or over 10% of total household income. (17,18). According to estimates, household health spending makes up 23% of health spending in developing nations and 45% of all health spending worldwide. (19). It is estimated that 1.3 billion people globally do not have access to quality, reasonably priced healthcare. Of those, 170 million are compelled to devote more than 40% of their household income to medical expenses. (18). Over 100 million people, or 25 million households, fall into poverty each year as a result of out-of-pocket health expenses. (20). A wide range of factors, broadly categorized as socioeconomic, clinical, and payment type, affect out-of-pocket health expenses. According to the research, out-of-pocket expenses were influenced by sociodemographic and economic characteristics such as wealth index. (21) and occupation (21), education, family size, sex, age, and marital status (22). Factors affecting payment types include distance from the hospital. (23), prescription costs (24), health insurance membership (25), and waived or exempted service

users. The existence of comorbidities, the length of the illness, and the stage of hypertension are examples of clinical factors. (21).

The aim of this study is to comprehensively analyze various research articles that focus on the financial burden and healthcare expenditure in low- and middle-income countries. By examining different methodologies, income types, and country-specific contexts, the study seeks to identify the underlying factors contributing to out-of-pocket health expenditures, particularly in primary healthcare settings. The ultimate goal is to better understand the impact of healthcare costs on impoverished populations and provide insights that could inform policy decisions aimed at reducing the economic strain on households in these regions.

Methods

Data Collection:

This systematic review aims to analyze the factors influencing out-of-pocket (OOP) expenditures in primary care settings across high-, middle-, and low-income countries. To identify relevant studies, we will conduct a comprehensive search of electronic databases, including PubMed, MEDLINE, EMBASE, and the Global Health Library. We will use a combination of keywords related to our research questions, such as "Out-of-pocket expenditure" OR "OOP expenditure," "Primary care" OR "Primary healthcare," and "High-income countries" OR "Middle-income countries" OR "Low-income countries." Additional relevant keywords, such as "patient copayment" and "user fees," may be included based on pilot searches. Our search strategy will employ Boolean operators (AND, OR, NOT) to refine the search and ensure accuracy, and it will be adapted to each database's specific search interface. We may also limit the search to articles published within a specific timeframe, such as the past 10 years. To supplement the database search, we will manually review the reference lists of included studies to identify any relevant research not captured in the initial search. We may also explore the World Health Organization (WHO) Global Health Library for additional LMIC-specific studies. Duplicates will be identified and removed using EndNote or other reference management software. Titles and abstracts of retrieved citations will be screened independently by two reviewers to assess initial eligibility based on predefined inclusion criteria. Full-text articles of potentially relevant studies will be reviewed by both reviewers for final inclusion based on the established criteria, with any discrepancies resolved through discussion or consultation with a third reviewer.

Study Selection

Inclusion Criteria:

1. **Primary Care Settings:** Studies must focus on primary care settings, including clinics, health centres, or hospitals that provide basic healthcare services.
2. **Out-of-Pocket Expenditures:** Studies must measure out-of-pocket expenditures, including direct payments for healthcare services, medications, or related expenses.

3. **Comparison Across Income Levels:** The study must compare OOP expenditures across high-, middle-, or low-income countries.
4. **Peer-Reviewed Publications:** Only studies published in peer-reviewed journals will be included to ensure quality and reliability.
5. **Quantitative Data:** The study must provide numerical data on OOP expenditures.

Exclusion Criteria:

1. **Specialized or Tertiary Care:** Studies focusing on specialized care or tertiary hospitals will be excluded, as the focus should be on primary care settings.
2. **Non-Reporting of OOP Expenditures:** Studies that do not measure or report out-of-pocket expenditures will be excluded.
3. **Non-Relevant Income Levels:** Studies conducted outside high-, middle-, or low-income countries will be excluded.
4. **Non-Peer-Reviewed Publications:** Studies not published in peer-reviewed journals will be excluded to ensure research quality.
5. **Non-Quantitative Data:** Case reports, editorials, or reviews, which typically do not provide quantitative data, will be excluded.

Data Extraction

Data were extracted using a standardized form, including study characteristics (author, year, setting), population details (sample size, demographics), and outcomes.

Quality Assessment

The quality of the included randomized controlled trials (RCTs) was assessed using Cochrane's risk-of-bias tool (version 1), as detailed in Chapter 8.5 of the Cochrane Handbook of Systematic Reviews of Interventions 5.1.0. This tool evaluates domains such as sequence generation (selection bias), allocation sequence concealment (selection bias), blinding of participants and personnel (performance bias), blinding of outcome assessors (detection bias), incomplete outcome data (attrition bias), selective outcome reporting (reporting bias), and other biases, with judgments categorized as low, unclear, or high risk of bias for each domain. For cohort and case-control studies, quality was assessed using the National Heart, Lung, and Blood Institute quality assessment tools, which consist of validated questions evaluating risk of bias and confounders. Responses to these questions were categorized as "yes," "no," "not applicable," "cannot be determined," or "not reported," with each study assigned an overall quality rating of "good," "fair," or "poor."

Data Collection

The initial search across all databases yielded a total of 4,996 articles. After removing 1,509 duplicates, the titles and abstracts of the remaining 3,487 articles were screened. Out of these, 3,435 articles were excluded because they did not meet the inclusion criteria. The remaining 52 articles were subjected to full-text screening, during which 37 were further excluded. Consequently, 7 articles were

deemed eligible and included in the systematic review. The study selection process is illustrated in the PRISMA flow diagram shown in **Figure 1**. This comprehensive search and screening process ensured that only relevant and high-quality studies were included in the review, providing a robust basis for analyzing the effectiveness of the interventions under investigation.

Quality Assessment of the Included Studies

The overall quality of the included randomized controlled trials (RCTs) was assessed as high using the Cochrane risk-of-bias tool. For observational cohort studies, as evaluated by the NIH quality assessment tool, only one study was rated as good, while the remaining seven studies were deemed to have fair quality. Additionally, one case-control study was classified as fair quality according to the NIH quality assessment tool for case-control studies.

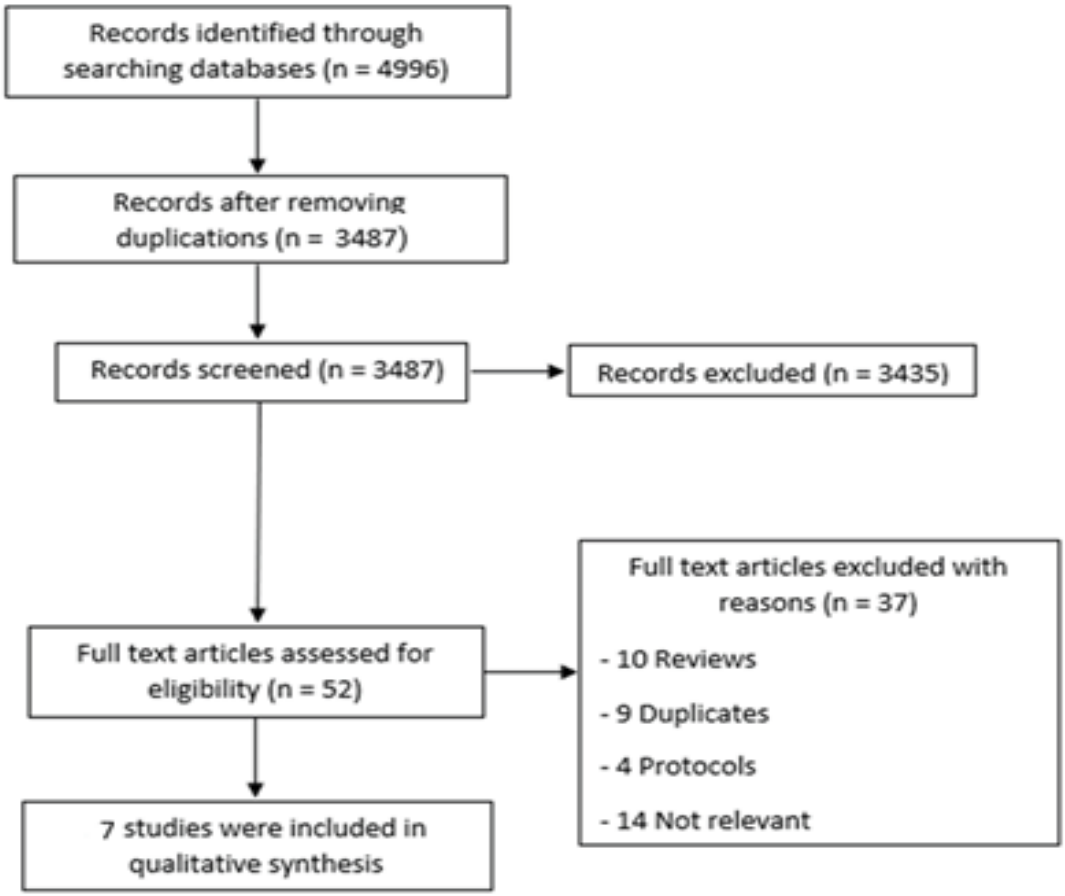

Figure 1. PRISMA flow diagram PRISMA: Preferred reporting items for systematic reviews and meta-analyses

Qualitative assessment

Maele2019 aimed to test different measurement options for primary healthcare (PHC) expenditure using the System of Health Accounts (SHA) 2011 framework

across 36 LMICs. The study's findings reveal significant variability in PHC expenditure per capita, ranging from $15 to $60. Notably, PHC expenditure as a percentage of current health expenditure (CHE) varied greatly, from 31% to 88%, depending on the definition used. This suggests that the way PHC expenditure is measured can substantially impact the reported figures. Including medical goods purchased outside of healthcare services increases the median PHC expenditure by over $13 per capita, highlighting the influence of expenditure definitions on reported outcomes. This variability emphasizes the need for standardized methodologies to ensure accurate tracking and comparability of PHC expenditure across countries.

Bolongaita2023 utilized a modelling approach to estimate the risk of catastrophic health expenditures (CHE) associated with out-of-pocket spending on primary care services in 34 LMICs. The study found that the risk of CHE is disproportionately higher among poorer quintiles, with a significant disparity between the poorest and richest quintiles. For instance, the risk in the poorest quintile was 6.8% compared to 1.3% in the richest quintile using a 10% CHE threshold. Additionally, certain disease areas such as cardiovascular diseases and mental/behavioral disorders presented higher risks of CHE. The findings underscore the need for targeted financial risk protection strategies, especially for high-risk disease areas and lower-income populations, to mitigate the financial burden of healthcare.

Laokri2018 conducted a population-based household survey in the Democratic Republic of the Congo (DRC), focusing on the impact of out-of-pocket expenditures on poverty. The study reported that over 17% of individuals experienced illness or injury, with a significant portion seeking outpatient care. This survey provides valuable insights into the financial strain caused by healthcare expenses in DRC, revealing that high expenditures can lead to substantial economic hardships for households. Understanding the distribution and impact of these expenditures can inform policy efforts aimed at reducing the financial burden on vulnerable populations.

Maele2018 was a methodological paper that explored different approaches for measuring PHC expenditure using the SHA 2011 framework. Although it did not present specific findings on PHC expenditures, it highlighted the importance of methodological rigour in developing standardized measurement approaches. The proposed methodologies and recommendations are crucial for improving the accuracy and consistency of PHC expenditure reporting, which can enhance comparative analyses and policy-making efforts.

Jéssica2022 conducted a cross-sectional survey in Brazil to assess out-of-pocket pharmaceutical expenditure among primary healthcare patients. The study found a high prevalence of out-of-pocket pharmaceutical expenses, with significant associations with factors such as higher income and health insurance coverage. The findings reveal that despite health insurance coverage, out-of-pocket costs for pharmaceuticals remain a substantial burden for many patients, particularly those with poorer health statuses and more chronic conditions. These insights stress the importance of addressing pharmaceutical cost barriers within health insurance schemes to reduce out-of-pocket spending.

Sirag2021 utilized macroeconomic panel data to examine the relationship between out-of-pocket health expenditure and poverty across 145 countries. The study found that out-of-pocket health expenditures above a certain threshold are associated with increased poverty. This macroeconomic perspective highlights the broader impact of health expenditures on economic well-being, emphasizing the need for policies that balance healthcare funding and poverty alleviation.

Alemayehu2023 assessed out-of-pocket health expenditure among hypertensive patients in Ethiopia. The study found that both direct medical and non-medical costs contribute significantly to the overall out-of-pocket expenditure. The findings highlight the financial challenges faced by patients with chronic conditions, pointing to the need for comprehensive financial protection mechanisms to alleviate the burden of out-of-pocket costs.

Study ID	**Age**	**Sex**	**Income Type**	**Participant count**	
Maele2019	Not mentioned (the paper does not provide any information about the age of the participants)	Not mentioned (the population sex is not mentioned in the paper)	The "Income type" of the countries included in the analysis is low-income and lower-middle-income countries.	Not mentioned (this paper does not report on a study with participants or a randomized controlled trial)	The "Country" in this study is not a single country, but rather a set of 36 low-income and lower-middle-income countries, as listed in the paper.
Bolongaita2023	Not mentioned (the paper does not mention the age of the participants, as it is a modelling study that does not involve any	Not mentioned (the population sex is not mentioned in the paper)	The "Income type" used in this analysis is simulated income distributions based on GNI per capita and the Gini	Not mentioned (the paper does not provide any information about the number of participants in the study)	Not mentioned (the paper does not explicitly state the country or countries that the authors

	primary data collection or participant enrollment)		index.		are from)
Laokri2018	Based on the information provided in the paper, the age range of the participants is not explicitly stated. However, the paper indicates that the study included participants of all ages, with a specific focus on children under 5 years old. The paper does not provide the exact age range but suggests the participants spanned a wide range of ages.	Not mentioned (the paper does not explicitly mention the sex or gender distribution of the study population)	Not mentioned (the paper does not explicitly mention the "income type" of the study population)	The total number of participants in the study was 4120 households.	The country is the Democratic Republic of the Congo (DRC).
Maele2018	Not mentioned (the paper does not provide any information about the age of the participants in the study)	Not mentioned (the paper does not mention the sex or gender of the populatio	The countries included in the study are low and lower-middle-income countries.	Not mentioned (the paper does not mention any specific participant count or randomization, as it is a	Not mentioned (the paper does not explicitly state the country or countries

		n studied)		methodological paper discussing how to measure primary health care expenditure, not a report on a specific study or trial)	that the authors are from)
Jéssica2022	The participant's age was 18 years or older, as specified in the eligibility criteria.	Female	The "income type" discussed in the paper is personal income, categorized into three groups: less than 1 Brazilian minimum wage, 1-2 Brazilian minimum wages, and greater than or equal to 3 Brazilian minimum wages.	The total participant count in the study was 1228 individuals.	The country mentioned in the paper is Brazil.
Sirag2021	Not mentioned (the paper does not mention the age of participants, as it is a macroeconomic study that does not involve individual-	Not mentioned (the population sex is not mentioned in the paper)	The "Income type" in Abdalla Sirag, Norashidah Mohamed Nor (2021) refers to the World Bank's income classificatio	Not mentioned (the paper does not provide any information about the number of participants in the study)	The "Country" in Abdalla Sirag, Norashidah Mohamed Nor (2021) is a sample of 145 countries

	level data)		ns, which include low-income, lower-middle-income, upper-middle-income, and high-income countries.		from 2000 to 2017. The specific list of countries is provided in Table A3 in the Appendix.
Alemayehu2023.	The participant age range was 44 to 64 years, with a mean age of 54.25 ± 11.02 years.	Both Genders	Not mentioned (the paper does not explicitly mention the "income type" of the study participants)	The total number of participants in the study was 346.	The country where this study was conducted is Ethiopia.

	Summary
Maele2019	The paper aims to test and examine different measurement options using the System of Health Accounts (SHA) 2011 for systematic monitoring of primary healthcare (PHC) expenditure in low-income and lower-middle-income countries, as PHC is considered a pathway to Universal Health Coverage and achieving sustainable development goals.
Bolongaita2023	The paper models the risk of catastrophic health expenditures associated with out-of-pocket spending on primary care services in 34 low-income and lower-middle-income countries, with the goal of informing the design of publicly financed essential health services packages that can provide financial risk protection.
Laokri2018	The paper aims to gain a deeper understanding of the poverty impact of using essential primary care services in selected provinces in the Democratic Republic of Congo (DRC) by estimating itemized individual-level medical and nonmedical expenses associated with outpatient health care utilization and assessing the major components and predictors of direct expenditure that may constitute a catastrophic burden on households.
Maele2018	The paper aims to develop a standardized methodology to

	measure primary health care (PHC) expenditure using the System of Health Accounts (SHA) 2011 framework, provide comparative PHC expenditure estimates for a number of countries, and formulate recommendations for future PHC expenditure tracking.
Jéssica2022	This paper summarises that it aimed to determine the prevalence and associated factors of out-of-pocket pharmaceutical expenditure (OOPPE) among primary healthcare patients in Brazil, finding a high prevalence of OOPPE that was associated with enabling factors like higher income and health insurance, as well as need factors like poorer health status and more chronic conditions.
Sirag2021	The paper investigates the relationship between out-of-pocket health expenditure and poverty using macroeconomic data from 145 countries, finding that out-of-pocket health expenditure above a threshold of around 29% of total health expenditure leads to increased poverty.
Alemayehu2023.	This paper summarises that it assessed the out-of-pocket health expenditure and associated factors among adult patients with hypertension in the Debre-Tabor Comprehensive Specialized Hospital in Ethiopia.

Study ID	**Methodology**
Maele2019	- Conducting a series of discussions and consultations with stakeholders to develop an operational definition for measuring PHC expenditure using the SHA 2011 framework - Exploring eight different definitional options for PHC expenditure, with six based on healthcare functions (HC) and two based on healthcare providers (HP) - Constructing estimates for each option using country health account data from 2011-2016, including breakdowns by HC and HP
Bolongaita2023	1. Obtaining disease-specific out-of-pocket (OOP) spending data from national health accounts 2. Using health service unit costs from the Disease Control Priorities, 3rd edition (DCP3) project 3. Relying on proxy indicators of health service utilization from various sources like the Demographic and Health Surveys and WHO STEPS reports 4. Simulating income distributions for each country using gross national income per capita and Gini index 5. Applying utilization rates to the simulated population and calculating OOP payments and risk of catastrophic health expenditures
Laokri2018	The study used a population-based household survey with a two-stage sampling strategy to collect data on healthcare utilization and out-of-pocket expenditures in 4 provinces of the Democratic Republic of Congo in 2014. The survey collected detailed information on the type, level and utilization of health services, accessibility to care, patient satisfaction, and disaggregated health expenditures.
Maele2018	- Using the System of Health Accounts (SHA 2011) framework

	to identify components of primary health care (PHC) expenditure - Exploring both the health care function (HC) classification and the health care provider (HP) classification within SHA 2011 to define PHC expenditure - Proposing and testing six different HC-based options for defining and measuring PHC expenditure, with the options building on each other incrementally - Analyzing data from 27 published health accounts country studies from 2012-2015, primarily from low and lower-middle income countries
Jéssica2022	- The study was conducted as an exit survey of primary healthcare patients in a large city in Brazil, with a sample size of 1219 participants. - The study assessed three main components of out-of-pocket pharmaceutical expenditure (OOPPE): the overall prevalence, the types of medicines purchased, and whether the medicines were covered by the national health system. - The study used a modified version of Andersen's behavioral model to examine factors associated with OOPPE, and analyzed the data using descriptive statistics and logistic regression.
Sirag2021	- The study used a dynamic panel threshold model to examine the non-linear relationship between out-of-pocket health expenditure and poverty. - The model allowed for endogeneity of the threshold variable (out-of-pocket health expenditure) and other regressors. - The Generalized Method of Moments (GMM) estimator proposed by Arellano and Bond was used to estimate the model. - The data was averaged over 3-year periods from 2000 to 2017 to fit the GMM estimator.
Alemayehu2023.	- Facility-based cross-sectional study conducted at Debre-Tabor Referral Hospital Chronic Illness Follow-up Outpatient department (OPD) from March to April 2020 - Sample size of 357 participants calculated using a single population mean formula - Systematic random sampling used to select every other hypertensive patient attending the outpatient clinic - Semi-structured interviewer-administered questionnaire used to collect information on out-of-pocket health expenditure, socio-economic and demographic characteristics, clinical factors, and payment type/modalities - Direct medical payments, direct non-medical payments, and indirect payments measured and used to calculate the out-of-pocket health expenditure - Data quality ensured through training of data collectors, pre-testing, supervision, and data cleaning - Linear regression analysis used to identify factors associated with out-of-pocket health expenditure

Study ID	**Study Design**
Maele2019	Based on the information provided in the paper, the study design appears to be an observational, retrospective analysis of secondary data from the System of Health Accounts (SHA) 2011 for 36 low- and middle-income countries. The study does not mention any randomization, control groups, or other

	experimental design elements, and the authors state they did not involve patients or the public. Therefore, this seems to be a non-experimental, data-driven study focused on testing different options for measuring primary healthcare (PHC) expenditure.
Bolongaita2023	Based on the information provided in the paper, the study design appears to be a modeling study that utilized secondary data from various publicly available sources to estimate the risk of catastrophic health expenditures for different health services and disease categories across 34 low-income and lower-middle-income countries. The study did not involve any primary data collection or experimental manipulation.
Laokri2018	The study design was a population-based, cross-sectional household survey with a linked health facility survey. It used a two-stage cluster sampling design, first selecting villages and then households within those villages. The survey had a high response rate of 94%.
Maele2018	Not mentioned (the paper does not describe a specific study design, as it is a methodological paper that aims to develop a standardized methodology to measure primary health care (phc) expenditure using the system of health accounts (sha) 2011 framework)
Jéssica2022	The study design was an observational, cross-sectional survey conducted in a single municipality in Brazil. It used a representative sample size calculation and a stratified sampling approach to ensure the sample was representative of the different community pharmacies in the area.
Sirag2021	The study design is a non-controlled, observational, macroeconomic panel data analysis that examines the non-linear relationship between out-of-pocket health expenditure and poverty across 145 countries from 2000 to 2017 using a dynamic panel threshold model.
Alemayehu2023.	The study design was a facility-based cross-sectional study conducted at Debre-Tabor Comprehensive Specialized Hospital from March to April 2020. It used a systematic random sampling technique to select 357 adult hypertensive patients as participants. The study employed descriptive statistics to estimate the out-of-pocket health expenditure and linear regression modeling to identify associated factors.

Study ID	**Independent variables**	**Dependent variables**	**Measured variables**
Maele2019	Not mentioned (the paper does not appear to present any independent variables that were manipulated or	Not mentioned (the paper does not present a modeling or experimental study with dependent variables)	1. PHC expenditure per capita in USD (PHC_pc) 2. PHC expenditure as a percentage of total CHE (PHC%CHE) 3. PHC domestic government

	controlled in an experiment or model)		expenditure as a percentage of PHC expenditure (PHC_ gghed%PHC) 4. PHC domestic government expenditure as total domestic government expenditure on health (PHC_ggehd%GGHED)
Bolongaita2023	- Health service utilization, captured through utilization indicators - Affordability, captured via the level of public financing and OOP health service unit costs - Income, simulated using gross national income (GNI) per capita as a proxy for average income and the Gini index as a measure of inequality	- Risk of catastrophic health expenditures (CHE) at different thresholds (10%, 25%, and 40% of annual income) for various health services and disease areas.	1) Disease-specific out-of-pocket (OOP) spending from national health account (NHA) reports 2) Health service unit costs from the DCP3 project 3) Health service utilization indicators from various sources like DHS, STEPS, WDI, HEFPI, and published literature 4) Gross national income (GNI) per capita and Gini index to simulate income distributions
Laokri2018	- Wealth index - Health facility scores - Patient satisfaction index - Severity of illness (days lost) - Individual demographic characteristics - Household composition and status - Socioeconomic factors - Care-seeking behavior - Availability and perceived quality of care - Affordability of care	- High expenditure (≥2 times the median OOPs) - Medium-high expenditure (≥ the median OOPs) - Extremely high expenditure (≥ 3 times the median OOPs)	1. Out-of-pocket expenditures for outpatient care 2. Wealth 3. Health facility scores 4. Patient satisfaction 5. Days lost due to illness 6. Demographic characteristics 7. Household composition and status 8. Socioeconomic factors 9. Care-seeking behavior 10. Availability and perceived quality of care 11. Affordability of care

Maele2018	Not mentioned (this paper does not appear to have any independent variables, as it is a methodological paper focused on developing a standardized approach for measuring primary health care expenditure rather than an experimental or modeling study)	Not mentioned (the paper does not present any dependent variables, as it is focused on developing a methodology for measuring phc expenditure rather than conducting a modeling or experimental study)	1. Current Health Expenditure (CHE) by health care function (HC), including curative care (inpatient and outpatient), medical goods, preventive care, and health system administration. 2. Current Health Expenditure (CHE) by health care provider (HP), including hospitals, ambulatory care providers, retailers, and preventive care providers.
Jéssica2022	- Predisposing factors: sex, age, self-reported skin color, marital status, and education - Enabling factors: personal income, individual health insurance, and perceptions of social capital (number of close friends, willingness of others to lend money, neighborhood trust, neighborhood help, neighborhood safety, and participation in community activities) - Need factors: self-reported health, number of chronic diseases,	- The occurrence of any expenditure on medicines in the last 3 months (yes/no) - Expenses incurred to purchase medicines covered by the public health system (SUS) but out of stock in the public pharmacy (yes/no) - The type of medicines purchased (for chronic diseases, acute diseases, or herbal medicines)	1. Out-of-pocket pharmaceutical expenditure (OOPPE), including: - Occurrence of any expenditure on medicines in the last 3 months - Expenses incurred to purchase medicines covered by SUS but out of stock in the public pharmacy - Type of medicines purchased (chronic, acute, herbal) 2. Predisposing factors: sex, age, self-reported skin color, marital status, education 3. Enabling factors: personal income, individual health insurance, measures of social capital 4. Need factors: self-reported health, number of chronic diseases, number of prescribed medicines

	and number of prescribed medicines used		
Sirag2021	1) Out-of-pocket health expenditure (OOP) 2) GDP per capita (GDP) 3) Government health expenditure (GHE)	- Poverty headcount ratio - Poverty gap index - Poverty gap squared index	1) Poverty measures: poverty headcount ratio, poverty gap index, and poverty gap squared index 2) Out-of-pocket health expenditure 3) GDP per capita 4) Government health expenditure
Alemayehu2023.	- Gender - Marital status - Religion - Wealth index - Distance from hospital - Frequency of visit - Comorbidity - Health insurance coverage	The dependent variable in this study is the out-of-pocket health expenditure (OOPHE) of hypertensive patients.	1. Direct medical out-of-pocket expenditures for hypertensive patients, including medication, fees, consultations, and lab tests 2. Direct non-medical out-of-pocket expenditures for hypertensive patients, including transportation and food costs 3. Indirect costs in terms of time spent by patients and caregivers seeking treatment over the course of a year 4. Overall out-of-pocket health expenditure for hypertensive patients, which included both direct medical and non-medical costs, measured on a per visit and annual basis

Study ID	**Main Findings**
Maele2019	- PHC expenditure ranges from $15 to $60 per capita across the 36 countries studied. - PHC expenditure as a percentage of current health expenditure (CHE) ranges from 31% to 88% depending on the definition option used. - Including medical goods purchased outside of healthcare services can increase the median PHC expenditure by over $13 per capita.

Bolongaita2023	- The risk of catastrophic health expenditures (CHE) is concentrated among poorer quintiles, with a 6.8% risk in the poorest quintile compared to 1.3% in the richest quintile using a 10% CHE threshold. - The risk of CHE is higher for certain disease areas like cardiovascular disease (7.8% using a 10% threshold) and mental/behavioral disorders (9.8% using a 10% threshold). - Lower cost health services have lower risks of CHE.
Laokri2018	- Over 17% of individuals reported illness or injury, with 65.6% seeking outpatient care on average once per episode. - 29.4% of individuals incurred excessive out-of-pocket expenditures for outpatient care, with key predictors including use of public facilities, dissatisfaction with care, household size, illness severity, and wealth. - Significant wealth-related inequities were found in service coverage, population coverage, and out-of-pocket payments for outpatient care.
Maele2018	- The paper proposes a standardized methodology to measure primary health care (PHC) expenditure using the System of Health Accounts (SHA) 2011 framework. - The proposed methodology was developed through consultations with various stakeholders, including policymakers and experts from different countries and organizations. - The paper provides the first comparative estimates of PHC expenditure for a sizable number of low and lower-middle income countries.
Jéssica2022	- The overall prevalence of out-of-pocket pharmaceutical expenditure (OOPPE) among primary healthcare patients was very high at 77%. - Most patients who had OOPPE purchased medicines to treat chronic diseases (94%). - OOPPE was associated with enabling factors such as higher personal income, holding health insurance, and higher neighborhood trust, as well as need factors such as poorer perception of health, multiple comorbidities, and higher number of prescribed medicines.
Sirag2021	- There is a threshold level of out-of-pocket health expenditure, around 29% of total health expenditure, above which it leads to increased poverty. - The threshold level of out-of-pocket health expenditure is higher in low and middle-income countries compared to high-income countries. Below the threshold, out-of-pocket health spending reduced poverty in low and middle-income countries, but increased poverty above the threshold. - The study did not find a clear relationship between government health expenditure and poverty.
Alemayehu2023.	- The annual mean out-of-pocket health expenditure of hypertensive patients was $113.40 ± $10.18 per patient. - Factors associated with higher out-of-pocket expenditure include being female, higher wealth status, living further from the hospital, having comorbidities, and not having health

	insurance.

Study ID	Recommendations
Maele2019	Not mentioned (the authors do not provide explicit "policy recommendations" in the paper)
Bolongaita2023	1) Consider the risk of catastrophic health expenditures (CHE) when prioritizing health services and designing essential benefit packages for universal health coverage (UHC). 2) Use financial risk protection (FRP) as an explicit criterion when assessing which health interventions to include in national essential benefit packages. 3) Replicate the modeling approach used in this study to quantify the FRP benefits of including different health services in essential benefit packages in low- and lower-middle-income countries.
Laokri2018	Not mentioned (the authors do not provide explicit "policy recommendations" in the paper)
Maele2018	1) Develop a clear operational definition of primary health care to support the methodology for measuring PHC expenditure. 2) Modify the SHA 2011 framework to add more granularity to better capture PHC expenditure, and improve data collection and estimation methods to better map to the classification and improve comparability. 3) Test the use of the SHA 2011 framework for monitoring PHC expenditure in alignment with national PHC strategies, and learn from country experiences to inform on the adaptability of SHA 2011 for this purpose.
Jéssica2022	The authors recommend that policies should focus on reducing out-of-pocket pharmaceutical expenditure (OOPPE) among primary care patients by addressing the issue of medicine shortages in the public health system (SUS). Specifically, the authors suggest that the adequate provision of free medicines would reduce OOPPE and increase access to medicines.
Sirag2021	1. Make poverty and income inequality reduction a top priority in economic policies. 2. Implement structural reforms to healthcare systems to eliminate financial risks and reduce excessive out-of-pocket health expenditure. 3. Increase investment in health-related infrastructure to improve access to healthcare and reduce the burden of catastrophic out-of-pocket health expenditure.
Alemayehu2023	1. The Ministry of Health should provide better subsidies on service and medication fees for hypertensive patients. 2. The Ministry of Health and regional health bureaus should strengthen early detection and prevention strategies for chronic comorbidities in hypertensive patients. 3. The Ethiopian health insurance agency should strengthen efforts to enroll more of the community into health insurance schemes and expand social health insurance. 4. Healthcare providers should focus on primordial prevention to minimize the severity of hypertension and comorbidities, and provide better home-based care for

	hypertensive patients in collaboration with health posts and community health workers

Summary of results

Demographic Characteristics:

- **Age:** The limited data available suggest that age may be a factor influencing OOP expenditures. One study found that older individuals incurred higher OOP costs. However, more comprehensive data is needed to draw definitive conclusions.
- **Gender:** Findings on the impact of gender on OOP expenditures were mixed. Some studies found no significant differences, while others reported higher expenditures among women.

Income and Socioeconomic Factors:

- **Income:** Lower income levels were consistently associated with higher OOP expenditures across studies.
- **Wealth Index:** In some studies, individuals with lower wealth indices reported higher OOP expenditures.
- **Insurance Coverage:** Having health insurance was generally associated with lower OOP expenditures, but the extent of coverage and the types of benefits varied across countries.

Healthcare Utilization:

- **Frequency of Visits:** Individuals with more frequent visits to healthcare providers tended to have higher OOP expenditures.
- **Severity of Illness:** Those with more severe illnesses or chronic conditions often incurred higher OOP costs.

Healthcare System Factors:

- **Accessibility:** Limited access to healthcare services, such as long waiting times or geographic barriers, could lead to higher OOP expenditures as individuals seek care from private providers.
- **Service Costs:** The cost of healthcare services, including medications and consultations, can vary significantly across countries and healthcare providers.
- **Quality of Care:** Perceptions of the quality of care can influence patients' willingness to pay for services, potentially affecting OOP expenditures.

Other Factors:

- **Social Capital:** Social support networks and access to financial assistance can influence an individual's ability to cope with OOP expenditures.
- **Cultural Factors:** Cultural beliefs and practices related to health and illness can affect healthcare utilization and spending patterns.

Discussion

Demographic characteristics play a significant role in out-of-pocket (OOP) expenditures in primary care. Studies indicate that age can influence these costs, with older individuals often incurring higher expenses. Gender impacts on OOP expenditures are variable; while some research shows no significant differences, other studies find that women generally experience higher expenditures. Income and socioeconomic factors are consistently linked with OOP costs. Lower income levels are associated with higher OOP expenditures across multiple studies. Similarly, individuals with lower wealth indices tend to report higher OOP costs. Insurance coverage is a significant determinant, with health insurance generally correlating with lower OOP expenditures. However, the extent and type of insurance benefits can vary widely depending on the country. Healthcare utilization also affects OOP expenditures. Individuals who visit healthcare providers more frequently typically face higher OOP costs. Those with severe or chronic illnesses often incur higher expenses due to the nature and extent of their conditions. Healthcare system factors, such as accessibility and service costs, further influence OOP expenditures. Limited access to healthcare services, whether due to long waiting times or geographical barriers, can lead individuals to seek care from private providers, increasing OOP costs. Additionally, the cost of healthcare services, including medications and consultations, can vary significantly across different countries and providers. Perceptions of care quality can also impact patients' willingness to pay for services, potentially affecting OOP expenditures. Other factors, such as social capital and cultural beliefs, contribute to the financial burden of healthcare. Social support networks and access to financial assistance can help individuals manage OOP costs. Meanwhile, cultural factors, including beliefs and practices related to health and illness, can influence healthcare utilization and spending patterns.

Financial Barriers and Systemic Failures

The data from Samia et. Al. (26) underscores that OOPPs might be even higher than reported due to unaccounted informal payments and fraudulent practices within health centers. For instance, in Kisantu District, DRC, staff were observed selling referral bills or charging for items covered by flat fees, reflecting broader systemic issues and highlighting the inverse care law phenomenon (27). This situation is exacerbated by the absence of nationwide cross-subsidization, leading to price discrimination and a lack of effective mechanisms to address healthcare provider responsiveness (27). Similarly, informal income sources significantly supplement health workers' earnings, contributing to the financial strain on the healthcare system. The study also notes that dissatisfaction with the healthcare system correlates with higher out-of-pocket expenses, suggesting that improving government subsidies in primary care could enhance both efficiency and equity.

Socioeconomic Determinants and Catastrophic Spending

Abdalla et al. elaborates on how socioeconomic factors drive out-of-pocket health spending. Variations in income, age, and education levels are significant determinants, with catastrophic health spending defined as expenditures exceeding 40% of household income (3,8,10). The study identifies that low-income

households face higher out-of-pocket costs due to inadequate health insurance coverage and the necessity of direct payments (28–30). This situation often leads to catastrophic expenditures, pushing households into poverty and exacerbating financial strain (15). Evidence from various countries, including Egypt, Serbia, and Chile, highlights the substantial impact of out-of-pocket payments on impoverishment and financial stress (31–34).

Prevalence and Variability Across Contexts

Jéssica et al. (35) examined the prevalence and factors associated with out-of-pocket payments for medicines among primary healthcare (PHC) patients. The study found a high prevalence of out-of-pocket payments (77%), often for medicines that should be covered by the public system but are unavailable in public pharmacies. This finding is consistent with previous research conducted in countries with free medicine distribution, such as Brazil, where out-of-pocket payments ranged from 65% to 83% (36). In contrast, studies from higher-income countries like Austria report much lower prevalence rates, emphasizing the disparity in access to essential medicines (37). The differences in out-of-pocket expenditure across countries highlight the need for cautious comparisons due to methodological variations and differences in health system structures (37,38).

This systematic review provides a comprehensive analysis of factors influencing out-of-pocket (OOP) expenditures in primary care settings. By synthesizing data from diverse studies, the review offers a broad understanding of how demographic characteristics, healthcare utilization, and socioeconomic determinants interact to affect financial burdens on patients. While the review highlights the importance of these factors, it is important to acknowledge the limitations of the included studies. The variability in study methodologies, geographical disparities, limited data on informal payments, and data inconsistency may affect the generalizability and reliability of the findings. Despite these limitations, the review offers valuable insights into the systemic issues contributing to high OOP expenditures. It underscores the need for policy improvements to address financial barriers to healthcare and mitigate the negative impact on vulnerable populations. By focusing on socioeconomic determinants, the review emphasizes the broader implications of these factors on healthcare access and affordability. Future research should aim to address the limitations identified in this review, such as standardizing methodologies, incorporating data on informal payments, and conducting studies within specific regions to capture local variations. Additionally, exploring the long-term consequences of OOP expenditures on individuals and households can provide further insights into the impact on health and well-being.

Conclusion

This systematic review highlights the multifaceted nature of out-of-pocket (OOP) expenditures in primary care, emphasizing the interplay of demographic, socioeconomic, and healthcare system factors. The analysis reveals a significant financial burden on individuals, particularly those from lower-income backgrounds, exacerbated by systemic issues and informal practices. To mitigate these challenges, targeted policy reforms are essential. Expanding insurance

coverage, enhancing regulation of informal payments, and introducing targeted subsidies can help reduce financial strain and improve equity in healthcare access. Future research should address methodological variations, incorporate data on informal payments, and explore local contextual factors to provide more accurate and actionable insights. By addressing these gaps, policymakers and healthcare providers can work towards a more equitable and sustainable primary care system, ultimately reducing financial barriers and supporting overall patient well-being.

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