External Development Partner and International Monetary Fund Influence on Domestic Health Financing Sources in Low- and Middle-Income Countries: Panel Data Analysis and Case Study in Senegal

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Declaration by candidate

I, Frederik Federspiel, confirm that the work presented in this thesis is my own. No artificial intelligence has been used in the work, other than the unavoidable use through using online search engines for information. Where information has been derived from other sources, I confirm that this has been indicated in the thesis. I have read and understood the London School of Hygiene & Tropical Medicine (LSHTM) research practice policies. I have done my utmost to follow these and all other LSHTM academic and ethical policies and regulations. To the extent of my knowledge, the work does not infringe upon any copyright or intellectual property rights. I have endeavoured to represent my data and interpret my results as accurately as possible, while acknowledging and discussing any remaining limitations and bias in an honest manner.

Frederik Federspiel

18 December, 2024

Abstract

Introduction

Equitably contributed domestic health financing is essential for making progress toward Universal Health Coverage (UHC) in Low- and Middle-Income Countries (LMICs). This PhD thesis explores how External Development Partners (EDPs) and the International Monetary Fund (IMF) influence the mix of domestic health financing sources in recipient/borrower countries through their financial and non-financial activities, including the debt and loan conditionalities that follow from loans.

Methods

The research applies a mixed-methods approach to study the research questions. This consists of an econometric cross-country panel data study and a case study in Senegal using key informant interviews, purposive document review and descriptive statistical analysis.

Results

At the global level, official development assistance for the health sector channelled via the government reduced both Government Health Expenditure as a Source (GHE-S) and Out-Of-Pocket payments (OOP) per Gross Domestic Product (GDP), while public external debt servicing per GDP was associated with a shift from GHE-S toward OOP out of all current health expenditure.

In Senegal, EDPs, including the World Bank (WB) after year 2000, and the IMF promoted GHE-S and community-based health insurance while seeking to reduce OOP. However, past WB promotion of user fees, ongoing IMF fiscal austerity measures, debt obligations and inadequate political priority may have limited GHE-S expansion and led to a continued high reliance on OOP.

Conclusions

In countries experiencing similar or worse debt burdens than Senegal, debt relief may be a necessary policy option to help generate needed fiscal space for health. Debt-for-health-swaps should be considered to ensure funds freed up also benefit the health sector, along with dedicated health spending floors in IMF programmes.

Building on the work in this thesis, more country case studies should be performed of EDP+IMF influence on domestic health financing sources as well as the country-level impacts of public debt on domestic health financing.

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cannot understand it. Your name brings tears to my eyes, but my heart is filled with appreciation for having known you. I dedicate this thesis to you and to my family.

Preface

This thesis consists of four introductory and methods chapters, a published analytical commentary, three main results chapters, and a discussion chapter. The published commentary does not directly address the research objectives but brings attention to the topic of the growing debt burdens in Low- and Middle-Income Countries (LMICs) and how this could impact domestic government health spending, presenting a brief research agenda pursued in Chapters 6 and 8, and making some preliminary policy recommendations.

The analytical commentary (Chapter 5) and the main results chapters (Chapters 6-8) were written in 1st person plural in anticipation of journal submission and honouring the input received from supervisors and our Senegalese co-author, however they are my own work, supported by their intellectual guidance.

The work carried out for this thesis has also allowed me to make contributions to related research projects as outlined below. These do not contribute to the thesis but address related research questions.

Published

"Equity of resource flows for reproductive, maternal, newborn, and child health: are those most in need being left behind?" Martinez-Alvarez M, **Federspiel F**, Singh N S, Schäferhoff M, Lewis Sabin M, Onoka C et al. BMJ 2020; 368 :m305 doi:10.1136/bmj.m305

"The Global Financing Facility at five: time for a change?" Seidelmann L, Koutsoumpa M, **Federspiel F**, Philips M. Sex Reprod Health Matters. 2020 Dec;28(2):1795446. doi: 10.1080/26410397.2020.1795446. PMID: 32772645; PMCID: PMC7887919.

Forthcoming

"Tracking progress in reproductive, maternal, newborn, child and adolescent health and nutrition: the Countdown to 2030 for Women's, Children's and Adolescents' Health report by Professor Ties Boerma". The Lancet. Prof Agbessi Amouzou; Prof Aluisio J D Barros; Jennifer Requejo; Cheikh Faye; Nadia Akseer; Prof Eran Bendavid; Cauane Blumenberg; Josephine Borghi; Sama El Baz; **Frederik Federspiel**; Leonardo Z Ferreira; Elizabeth Hazel; Sam Heft-Neal; Franciele Hellwig; Li Liu; Melinda Munos; Catherine Pitt; Yushra Ribhi Shawar; Prof Jeremy Shiffman; Yvonne Tam; Neff Walker; Pierre Akilimali; Prof Leontine Alkema; Paoli Benhanzin; Peter Binyaruku; Prof Zulfiqar Bhutta; Andrea Blanchard; Hannah Blencowe; Ellen Bradley; Nouria Brikci; Beatriz Caicedo-Velásquez; Anthony Costello; Winfred Dotse-

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List of abbreviations

2SLS	Two-stage least squares
ABBB	Arellano-Bover/ Blundell-Bond
AFDB	The African Development Bank
ANSD	National Agency of Statistics and Demography
BLUE	Best Linear Unbiased Estimator
BMGF	Bill and Melinda Gates Foundation
BRD	Battle-Related Death
CBHI	Community-Based Health Insurance
CHE	Current Health Expenditure
CPF	Country Partnership Framework
CRS	Creditor Reporting System
DAC	Development Assistance Committee
DAH	Development Assistance for Health
DAHG	Development Assistance for Health to Government
DAHNG	Development Assistance for Health to Non-Government
DHS	Demographic and Health Surveys
DRM	Domestic Resource Mobilisation
EDP	External Development Partner
FE	Fixed-Effects
GHED	Global Health Expenditure Database
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GDP	Gross Domestic Product
GGD	General Government Gross Debt
GGHE	General Government Health Expenditure
GGHE-D	Domestic General Government Health Expenditure
GGE	General Government Expenditure
GHE	Government Health Expenditure
GHE-A	Government Health Expenditure as Agent
GHE-S	Government Health Expenditure as Source
GLS	Generalized Least Squares
GMM	Generalized Method of Moments
GNI	Gross National Income
HIC	High-Income Country
HIPC	Heavily Indebted Poor Countries
HSS	Health Systems Strengthening
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IFI	International Financial Institution
IHME	Institute for Health Metrics and Evaluation
IMF	International Monetary Fund
LDC	Least Developed Country
LMC	Lower-Middle income Country
LMICs	Low- and Middle-Income Countries

LSHTM	London School of Hygiene & Tropical Medicine
LTEF	Long-Term Expenditure Framework
MDG	Millennium Development Goal
MDRI	Multilateral Debt Relief Initiative
MLE	Maximum Likelihood Estimation
MoF	Ministry of Economy and Finance (Senegal)
MHSA	Ministry of Health and Social Action (Senegal)
MNCH	Maternal and Child Health
MTEF	Medium-Term Expenditure Framework
NGO	Non-Government Organization
NHA	National Health Accounts
NPISH	Non-Profit Institutions Serving Households
ODA	Official Development Assistance
ODA+ for health	Official Development Assistance+ for health
OECD	Organisation for Economic Co-operation and Development
PCI	Policy Coordination Instrument
PPG	Public and Publicly Guaranteed
PRGF	Poverty Reduction and Growth Facility
PRSP	Poverty Reduction Strategy Paper
PSI	Policy Support Instrument
RMNCH	Reproductive, Maternal, Neonatal and Child Health
RCF	Rapid Credit Facility
RFI	Rapid Financing Instrument
RSF	Resilience and Sustainability Facility
SRMNCAH	Sexual, Reproductive, Maternal, Neonatal, Child and Adolescent Health
SAP	Structural Adjustment Program
SBA	Stand-By Arrangement
SCF	Standby Credit Facility
SDR	Special Drawing Rights
SHA	System of Health Accounts
SHI	Social Health Insurance
SSI	Semi-Structured Interview
UHC	Universal Health Coverage
UN	United Nations
VAT	Value-Added Tax
VHI	Voluntary Health Insurance
VHPS	Voluntary Health care Payment Schemes
WHO	World Health Organisation
WB	World Bank
UHC	Universal Health Coverage
UN	United Nations

1. Chapter 1: Introduction

This chapter presents relevant backgrund for the thesis, positions the research in relation to recent developments in global health and development concepts, to then describe the aims, objectives and structure of the thesis.

1.1. Background

1.1.1. Universal Health Coverage through equitable domestic health financing

Universal Health Coverage (UHC) is characterized by all members of a country population having access to quality health services where and when they need them, in a manner that protects them from having to individually carry the burden of payment for their own care (1). UHC, including financial risk protection, i.e. protection from the risk of suffering financial hardship when seeking health services (2), forms a cornerstone of the health Sustainable Development Goals (SDGs, goal 3.8) (3), and has become increasingly recognized as an essential development priority (4). A necessary step in making progress toward UHC is that countries finance their health systems in an equitable manner, improving health service access in an affordable way, including for poor and vulnerable groups, and achieving lasting public health improvements without causing financial hardship to individuals and households (5, 6). This latter dimension necessitates a degree of progressivity of financing, whereby contributions made to the health system align with people's ability to pay (4, 7-15). Tax-based contributions from the government tend to be more progressive than e.g. user fees at the point of care, as it is most often raised as a proportion of income whereas user fees do not take into account a person's income or other financial means (4). The reliance on different types of health financing sources in a country therefore matters in its pursuit of UHC. Do countries pursue a path with a high reliance on user fees at the point of care, or Out Of Pocket Payments (OOP), do they manage to increase the more progressive source of health financing from domestic government revenue (Government Health Expenditure as a Source, GHE-S), or do they pursue other paths such as Social Health Insurance (SHI) or Voluntary Health Insurance (VHI)? For Low- and Middle-Income Countries (LMICs), these paths sit in a complex political, macroeconomic and fiscal context, where among other factors, External Development Partners (EDPs)[1] and International Financial Institutions (IFIs) (e.g. the International Monetary

[1] For clarity, the term EDP used in this thesis covers all official international organisations with a development mandate, both bilateral e.g. the UK Department for International Development, and multilateral e.g. UNICEF. NGOs and private philanthropies are generally excluded, except for the case of the Bill and Melinda Gates Foundation (BMGF) due to its shere size and impact in the health sector. The WB thus falls under both the categories of being an EDP and an IFI, while the IMF technically does not have a development mandate and thus cannot be classified as an EDP, although it arguably works at a central, macroeconomic level that strongly co-determines the economic

Fund (IMF), the World Bank (WB), the African Development Bank (AfDB) and others) disburse development assistance and non-concessional loans and provide technical advice to governments. It is at this intersection, between key external official bilateral and multilateral institutions and the domestic government and country health system that this research is situated.

1.1.2. External partners and domestic health financing

A major part of the financial transactions made with EDPs + IMF are as concessional and non-concessional loans that all need repayment, leading to a financial outflow from LMICs that exceeds the original inflow due to interest accumulation (and a net real-term outflow if interests exceed inflation). Debt servicing levels in particular have expanded substantially over the past decade (16). This has led to growing concerns over governments' ability to finance public sectors including the health sector, i.e. overall fiscal space, defined by the World Health Organisation (WHO) as "*the budgetary room allowing a government to provide resources for public purposes without impacting fiscal sustainability*", and the fiscal space for health, threatening progress toward UHC (17-22). In 2023, 55% of Least Developed Countries (LDCs) and other LICs were assessed as being at high risk of, or in, debt distress (20). While a significant proportion of the Public and Publicly Guaranteed (PPG) external debt in the world's poorest countries, i.e. debt owed by the government and its public bodies as well as private debt guaranteed by public bodies to external creditors[2] (16, 23), derives from private creditors (21% in 2022 among WB International Development Association (IDA)-eligible countries), most of it comes from external official creditors (79% in 2022) (18). With their financial assistance including loans that require repayment from government budgets, are EDPs indeed supporting LMICs to pursue development paths characterized by growing GHE-S, supporting progress on UHC?

As mentioned, assistance from the EDPs + IMF is also provided in the form of technical advice, policy advice, capacity building and more. As a distinguishing feature from other external official creditors, the IMF and WB provide their loans under programs that come with extensive policy recommendations and loan conditionalities relating to the fiscal, macroeconomic, and sectoral level (WB being the key sectoral policy advisor of the two) (24, 25). Developed in collaboration with borrower governments, these programs constitute an overall macroeconomic framework setting the boundaries and trajectories for participating LMIC

development trajectory of its debitor countries. The term EDPs + IMF is therefore used to group the main external official partners of LMICs in the development and financial sphere.

[2] WB data does not count debt to the IMF as part of PPG external debt, but refers to this as the separate category: "Use of IMF credit and special drawing right allocations" (18).

economies. This gives the IMF and WB a privileged and powerful position in the centre of domestic policy making in borrower LMICs, making them core candidates for scrutiny of external influences on domestic health financing policy, influence that has been both alleged and observed in many contexts (26-40).

To understand both the financial and non-financial influence of EDPs + IMF on domestic health system financing in this thesis, the question is therefore further asked whether the non-financial interactions, policy recommendations and conditionalities that follow with external financing, affect how countries finance their health systems, the fiscal space available for health, and the mix of health financing sources, with ensuing implications for the progress toward UHC.

A dedicated exploration of the relationships between external financial assistance from EDPs + IMF, their policy influence, and domestic health sector financing, may be important to identify which components of their activities support or hinder progress toward health financing being more equitably contributed with adequate financial risk protection in pursuit of UHC. In particular, the growing debt burdens experienced by many LMICs renders the exploration and understanding of these relationships ever more topical.

1.1.3. Universal health coverage and domestic resource mobilisation

The global development community has increasingly focused its attention on achieving sustainable development and UHC through developing countries' own resources. This is mainly referred to as Domestic Resource Mobilization (DRM), defined by the WB as "*increasing the flow of taxes and other income into government treasuries*" i.e. increasing public revenue (41). This expands overall fiscal space and hence fiscal space for health, provided the health sector is prioritised and benefits from increases in domestic revenue. If increased domestic revenue is allocated to the health sector, this should help improve the degree of progressivity of health financing, enhancing equity of health financing contributions at the macro-level in terms of to what degree financial contributions are made in proportion to ability to pay *(42), ceteris paribus.* A 2017 WB report outlining a series of strategies for strengthening DRM stated that: "*Domestic resources are central to achieving development objectives*" (43). The United Nations (UN) has convened in a series of meetings on international development financing, first in Monterrey, Mexico in 2002, then in Doha, Qatar in 2008, and then in Addis Ababa, Ethiopia in 2015 (44-46). Through these meetings, the concept of DRM has received increasing mention and has become a central component to achieving sustainable development (44-46). To help translate this agenda into action, the Addis Ababa Action Agenda was followed up by the Addis Tax Initiative, supported by more

than 50 country governments, aiming to increase DRM and the effective use of these resources through taxation mechanisms (47-50). In a similar vein, the Organization for Economic Co-Operation and Development (OECD) with its Development Assistance Committee (DAC) made up by 31 of the world's major donor countries plus the European Union (51), has established a "Global Partnership for Effective Development Co-operation" (2014) (52). This succeeded a series of High Level Fora on Aid Effectiveness between 2003-2011 (53-55), and it arrived at the conclusion that "*no country should be dependent on others' resources for its own development*" (48, 52, 56), thus highlighting the need for mobilization of domestic resources and envisaging a global transition beyond development assistance. Their followup 2022 high-level summit declaration on effective development cooperation mentioned that development co-ordination should catalyse DRM and effective DRM being crucial (57).

In light of the growing emphasis on DRM, an improved understanding of whether and how EDPs+IMF are indeed supporting countries to make the proposed transition and fund health services from tax-based domestic revenue without patients suffering financial hardship at the point of care, in the pursuit of UHC, seems warranted.

The aims and objectives for this research are as follows.

1.2. Research aims and objectives

This research aims to investigate how EDPs + IMF affect the mix of domestic health financing sources in recipient/borrower countries. It uses a cross-country panel data study and a case study of Senegal to pursue the below objectives.

1. To investigate the relationships between development assistance, public external debt and IMF loan conditionalities and the levels and balance of Government Health Expenditure as a Source (GHE-S) and Out-Of-Pocket payments (OOP) among 105 LMICs from 2005-2019 (Chapter 6).
2. To explore mechanisms of development partner influence on the mix of domestic health financing sources present in Senegal (Chapter 7).
3. To explore how external official lending, public external debt obligations and IMF/WB policy recommendations and loan conditionalities affect the mix of domestic health financing sources in Senegal (Chapter 8).
4. To develop recommendations for policy and for future research based on the study findings (Chapters 6, 7, 8 and 9)

1.3. Thesis structure

The remainder of the thesis is structured as follows:

- Chapter 2 introduces key concepts, terminology and variables used in this thesis, including their levels and trends.

- Chapter 3 provides an overview of the literature underlying the research topic, identifies research gaps, and explains the economic hypotheses to be explored in this thesis and the conceptual framework guiding this exploration as informed by the literature.
- Chapter 4 describes the methods used in this thesis and the epistemological position of the research.
- Chapter 5 presents a comparative analysis of debt servicing and government health expenditure in LMICs.
- Chapter 6 presents the results of a multi-country panel data analysis of the associations between development assistance, public external debt, IMF loan conditionalities, and GHE-S and OOP in 105 LMICs from 2005-2019.
- Chapter 7 presents the results of a mixed-methods case study investigating development partner mechanisms of influence on the mix of health financing sources in Senegal.
- Chapter 8 presents the results of a mixed-methods case study investigating how development loans, public external debt and IMF/WB policy recommendations and conditionalities have affected the different domestic health financing sources present in Senegal.
- Chapter 9 brings together and discusses the key findings in chapters 5-8, discusses limitations of the research, and makes recommendations for policy and future research based on the study findings.

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2. Chapter 2: Key concepts, terminology, levels and trends

Some of the terminology used in this thesis has been introduced in the previous chapter. This chapter introduces further relevant key concepts, variables and associated terminology for health financing, development assistance, and International Monetary Fund (IMF) and World Bank (WB) programmes and loan conditionalities, including their levels and trends.

2.1. Health financing concepts, characteristics, levels and trends

2.1.1. Main health financing functions

The three main functions of health financing have been conceptualised as A: revenue collection, B: pooling, and C: purchasing (1-3). Revenue collection refers to the way in which money is raised for the health system, e.g. from tax contributions via the government, to insurance schemes as premiums, or directly at the point of care (2, 3), as explained in the following sections. Pooling refers to the collection of contributed funds in a shared pool (2, 3). This serves functions of sharing financial risk across individuals should a member of the pool fall ill, and if funds are contributed progressively i.e. according to ability to pay, a funding pool may also serve to redistribute funds from wealthier to poorer pool members, referred to as so-called cross-subsidy (2, 4, 5). Purchasing refers to the payment or funding allocation to health service providers, which in turn determines which health services are available to whom (2, 3).

This thesis relates to the first two main functions of health financing: First and foremost from which sources revenue is collected but also to what extent it is pooled, as the different main sources of financing span from no pooling to national-level pooling (Section 2.1.3). These functions in turn relate to concepts of equity and progressivity as explained below.

2.1.2. Conceptualisation of health financing equity and progressivity

Equity has traditionally been used to describe the concepts of “fairness”, “justice” or “due proportion”, as opposed to the concepts described by equality of “sameness” or “equal distribution” (6). The concept of due proportion implies an unequal treatment in proportion to some quality that is thought to hold moral value. In 1875, Karl Marx popularised the slogan: “*From each according to his ability, to each according to his needs*” (7). Scottish philosopher DD Raphael wrote in 1946: “*Unequal treatment, then, is justified when the general claim to equality is overridden by an additional special claim*”, and “*special need gives rise to a special moral claim*” (8). Health economists Culyer and Wagstaff concurred with the notion of unequal treatment for unequal moral claims or needs in relation to health care in 1994: “*the principle*

of distribution according to need calls for unequal expenditures" in favour of those with higher needs (9). For contributions, Culyer wrote in 2015 that equity implies: "*lower/higher contributions from households with a lower/higher ability to pay*" (10). This is captured in Marx' slogan: From each according to ability (7, 10). Culyer and Wagstaff further define this as "vertical equity": "*unlike treatment of unlike individuals*", as opposed to "horizontal equity": "*like treatment of like individuals*" (9, 10). These concepts originate from Aristotle's Nicomachean Ethics (11). This thesis follows these concepts and defines vertical equity as unequal contribution according to ability to pay. Such contributions can be made either proportionally or progressively, meaning either in direct proportion to ability to pay, or as a growing proportion of ability to pay with higher ability to pay (12, 13). Horizontal equity is relevant for health financing allocations - equal financing allocations for people with equal need - which this thesis does not consider.

Financing progressivity is usually assessed using Financing Incidence Analysis (FIA), where vertical equity is directly measured at the household level by comparing burden of payment with people's ability to pay (e.g. (13-21)). This thesis does not undertake FIA, but instead explores the influence of development partners on the mix of health financing sources at the macroeconomic level and uses that to consider the possible implications for vertical equity, given our understanding of the degree of progressivity of different key health financing sources. Tax-based contributions for instance tend to have a degree of proportionality with ability to pay or may even be contributed progressively e.g. as tiered income tax, while user fees charged at the point of care when one has fallen ill do not take into consideration a person's ability to pay for the health services needed (22).

Prepayment describes the payment of funds before they are needed. It is an essential component of equitable health financing contributions (22): If funds are not prepaid, the burden of payment will fall on the patient at the point of care, i.e. user fees. This implies payment irrespective of ability to pay, which also implies a disproportionate placement of the burden of payment for health services on the poor due to the positive link between poverty and need for health care (23).

Prepayment allows for pooling of contributions. The more members of a pool, the larger the degree of financial risk sharing, meaning when one person falls ill, there are more people to carry the burden of payment (24, 25). Pools can vary in the number of members, the amount of funds in a pool, and the scale of pooling (from community to national level). Cross-subsidy, i.e. the redistribution of funds from rich to poor, occurs when individuals across the income and wealth spectra are part of the same pool and contribute according to ability to pay (4).

Due to the positive links between income/wealth and health, this usually also implies risk sharing via the healthy paying for health services for the sick (23).

In summary, equitable health financing contributions are in this thesis defined as being according to ability to pay, funds being prepaid and pooled (the larger the pool, the better). This entails cross-subsidy and financial risk-sharing between wealthier and poorer pool members. A higher degree of financing progressivity is considered more equitable.

2.1.3. Main health financing sources

Health systems are financed by the following five main sources of funding, as categorised by the World Health Organisation (WHO) System of Health Accounts (SHA) (26) and instrumentalised in the Global Health Expenditure Database (GHED) (27). A: Government domestic revenue, which refers to all government transfers made to the health sector that are domestic in origin, i.e. from taxes, fees, levies, revenue from state enterprises, etc. B: Social Health Insurance (SHI) contributions from employers and employees. C: Voluntary prepayments to Voluntary Health Insurance (VHI) schemes, which broadly correspond to Voluntary Healthcare Payment Schemes (VHPS). D: Out Of Pocket payments (OOP), e.g. user fees and other patient-borne costs at the point of care. E: External health financing for aid-recipient countries, which may be given in the form of development assistance for the health sector, and can go either through the government or be channeled directly to a health institution or programme. Governments may co-finance social health insurance schemes and voluntary health insurance schemes, which the WHO SHA and GHED take into account in the joint indicator: Domestic General Government Health Expenditure (GGHE-D). This is the standard measure for a government's own financing of the health sector, and can also be referred to as Government Health Expenditure as Source (GHE-S).

Domestic government financing has the highest degree of pooling of funds and thus the highest level of financial risk sharing, and it is considered the most equitable and progressive of these main sources (28). While the composition of tax revenue sources varies greatly across Low- and Middle-Income Countries (LMICs), the principal sources of taxation - personal and corporate income and wealth taxes, Value-Added Tax (VAT), and trade taxes (29) – tend to be levied from the formal sector, with the poorest members of society, the unemployed, smallhold farmers and informal sector workers, mainly contributing in the form of VAT on part of their consumption[3]. This means that in terms of contributions, the burden of

[3] Key consumption goods such as staples, bread, milk etc. are often exempt from VAT, and in subsistence contexts, consumption may be lower among poorer people, which leads to some progressivity of VAT.

payment for domestic government health financing is larger for wealthier individuals (progressivity), and that money is redistributed from those with more means to those with less (cross-subsidy) (4, 5).

SHI schemes usually start with formal sector workers with various degrees of expansion beyond this group, with different models of co-contribution from employer, employee and the government. The blend of financing sources will determine the overall progressivity of this source, but the pools of these schemes are limited to different groups of employees, that will generally tend to be financially better off than informal sector workers, unemployed, children, or retirees (if not covered based on past employment). This means that the level of cross-subsidy from rich to poor and from healthy to sick may be limited, while the level of financial risk-sharing extends to the given size of the pool. These varying characteristics lead to variations in how equitable different SHI schemes can be considered.

VHI or VHPS may, in relatively wealthier middle-income countries, take the form of private health insurance mainly purchased by growing upper- and middle classes that seek higher quality or faster services than what the public system has to offer (30). In the poorest settings, VHI/VHPS are constituted mainly by Community-Based Health Insurance (CBHI) schemes to help cover user fees for health care (30). Funds are thus pooled, but pools are typically smaller as they are locally held with lower financial risk sharing than for domestic government health financing. As participants in such schemes tend to be from comparable socioeconomic strata, and sometimes within a given geographical area, there is a relatively lower level of cross-subsidy both between socioeconomic strata and geographical areas in VHI/VHPS as compared to GHE-S. The degree of progressivity of financing is limited by the variation in ability to pay between members, and other considerations of relevance to equity of health financing contributions such as pooling, prepayment and associated financial risk protection are also variable.

OOP is the most regressive and least equitable form of financing, where the same costs are borne by any health system user irrespective of that user's ability to pay (13), funds are not prepaid and financial risk is not pooled (28). OOP has been shown to cause financial catastrophe for households, push people into poverty, exacerbate financial inequality and lead to inequitable health service access and lower service use among poorer populations (22, 28, 31-34). OOP has been associated with adverse health outcomes when making up a larger proportion of total health spending (35, 36). Reducing user charges has been associated with improved health outcomes, particularly among children and low-income groups (37), while

expansion of government health spending has been associated with mortality reductions, especially among children under 5 (35, 36).

Development assistance for the health sector can arguably be seen as a highly progressive transfer of funds from wealthier tax-payers in donor-countries to LMICs (17). However, in line with the global move toward supporting countries to be able to finance their health systems from domestic funds and eventually become aid-independent (Chapter 1), this research focuses on what happens to the mix of *domestic* health financing sources when external health financing is received.

2.1.4. Universal Health Coverage

Universal Health Coverage (UHC) has three main dimensions, as illustrated in Figure 2.1: Providing more health services of better quality; to a greater proportion of the population in need; while increasing the level of financial risk protection (38). From a health financing perspective, aside from efficiency gains and health service price decreases, providing more services of higher quality to more people generally requires more funds, which due to the critical component of increased financial risk protection have to be prepaid, contributed according to ability to pay, and pooled (39). Pooled health financing has been found to be a strong driver of progress on UHC in LMICs, along with efficiency gains and contextual factors (40). In terms of the mix of domestic health financing sources in LMICs, these changes correspond to lowering reliance on OOP while expanding more equitable health financing sources such as GHE-S, SHI, or to some extent VHI, although the latter two may entail varying degrees of cost sharing. This thesis does not examine service or population coverage, but rather it focuses on the financial foundation for expanding these in an equitable manner whereby prepaid, pooled and progressively contributed funding is increased and cost sharing is reduced.

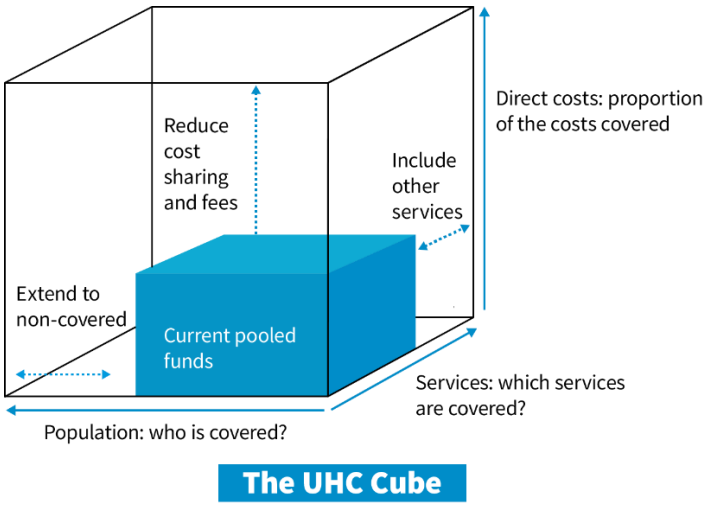

Figure 2.1: The Universal Health Coverage (UHC) Cube (38). Figure reproduced with permission from the World Health Organization (WHO) from the webpage: "What are the Overall Principles of HBP Design?", available at https://www.who.int/teams/health-financing-and-economics/economic-analysis/health-technology-assessment-and-benefit-package-design/resource-guide-for-the-use-of-hta-and-hbp-design-processes/what-are-the-overall-principles-of-hbp-design, accessed on June 21, 2024. No modifications made. Website copyright 2024.

2.1.5. LMIC health financing levels and trends

There is profound inequality in Current Health Expenditure (CHE) between country income groups, both in absolute terms and per capita (constant 2021 US$) (Figure 2.2). In 2021, CHE was $23 billion in Low-Income Countries (LICs), $371 billion in Lower-Middle income Countries (LMCs), and $1631 billion in Upper-Middle Income Countries (UMICs). Per capita, CHE was $38 in LICs, $109 in LMCs, and $646 in UMICs. Relative to Gross Domestic Product (GDP), CHE corresponded to 5.3% in LICs, 4.1% in LMCs, and 6.0% in UMICs.

In all country income groups, CHE has expanded roughly four-fold between 2000-2021. Per capita, this has corresponded to an approximate doubling in LICs and LMCs and a tripling in UMICs. Relative to GDP, growth has been more limited. Over the same time period, CHE in LICs has grown from 4% to 5.3% of GDP, increased slightly in LMCs from 3.7% to 4.1%, and grown in UMICs from 5.3% to 6% in UMICs.

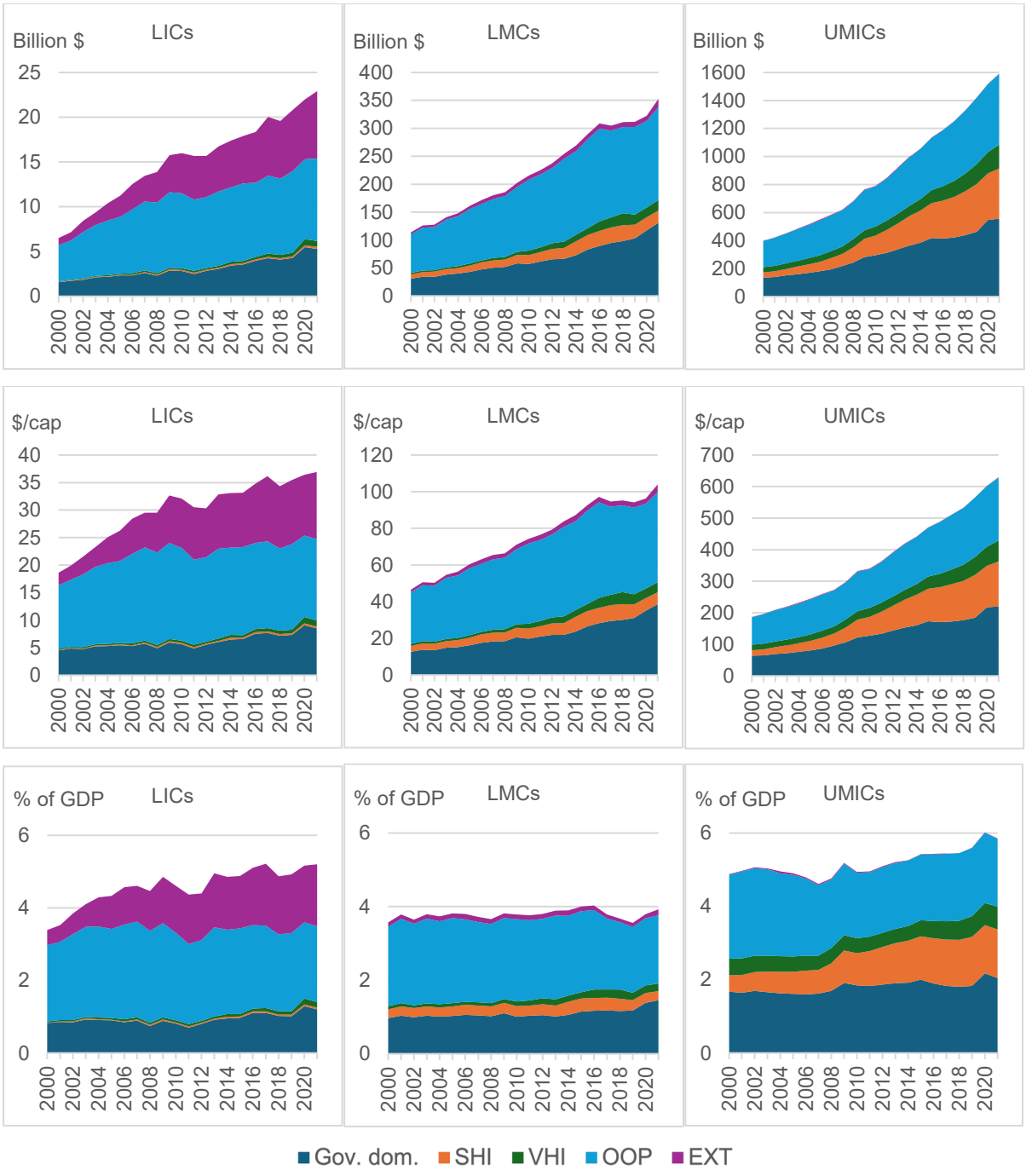

Figure 2.2: Main health financing sources in LMICs, 2000-2021, separated by World Bank income group (27). Constant 2021 US$. "Gov. dom.": Transfers from government domestic revenue. "SHI": Social health insurance contributions. "VHI": Voluntary Health Insurance contributions. "OOP": Out of pocket payments. "EXT": External health financing. Note: This figure shows financing sources, while on the expenditure side of national health accounts, part of GHE-S goes to SHI and VHI.

There are clear differences in the composition of CHE between country income groups. In LICs, both Out Of Pocket payments (OOP) and Government Health Expenditure as a Source (GHE-S) have expanded slightly per capita and per GDP, but the main addition of health financing has come from external sources. GHE-S has decreased as a share of CHE from 33% in 2000 to 23% in 2021, and OOP/CHE has decreased from 52% 2000 to 39% in 2021,

mainly due to expansion of external health financing. Voluntary Health Insurance (VHI) and Social Health Insurance (SHI) are still marginal.

In LMCs, expansion of GHE-S has been stronger than that for OOP, resulting in a growing share of CHE from 32% in 2000 to 41% in 2021, while OOP/CHE has decreased from 58% in 2000 to 45% in 2021. VHI and SHI is more prominent, and external health financing less so.

In UMICs, both GHE-S and SHI have expanded strongly, and more so than the expansion of OOP, resulting in GHE-S reaching 56% of CHE in 2021 from 40% in 2000, and a contraction of OOP as a share of CHE from 43% in 2000 to 31% in 2021.

2.1.5.1. Government health spending levels in perspective

GHE-S across LMICs is insufficient for serving the health needs of country populations (27, 41-44). The most recent data on domestic spending levels fall far short of the 2001 Abuja declaration pledge by African Union countries to spend 15% of government budgets on the health sector (45), both when looking only at GHE-S and when including external transfers distributed by governments (on-budget development assistance for the health sector) (27) (Figure 2.3).

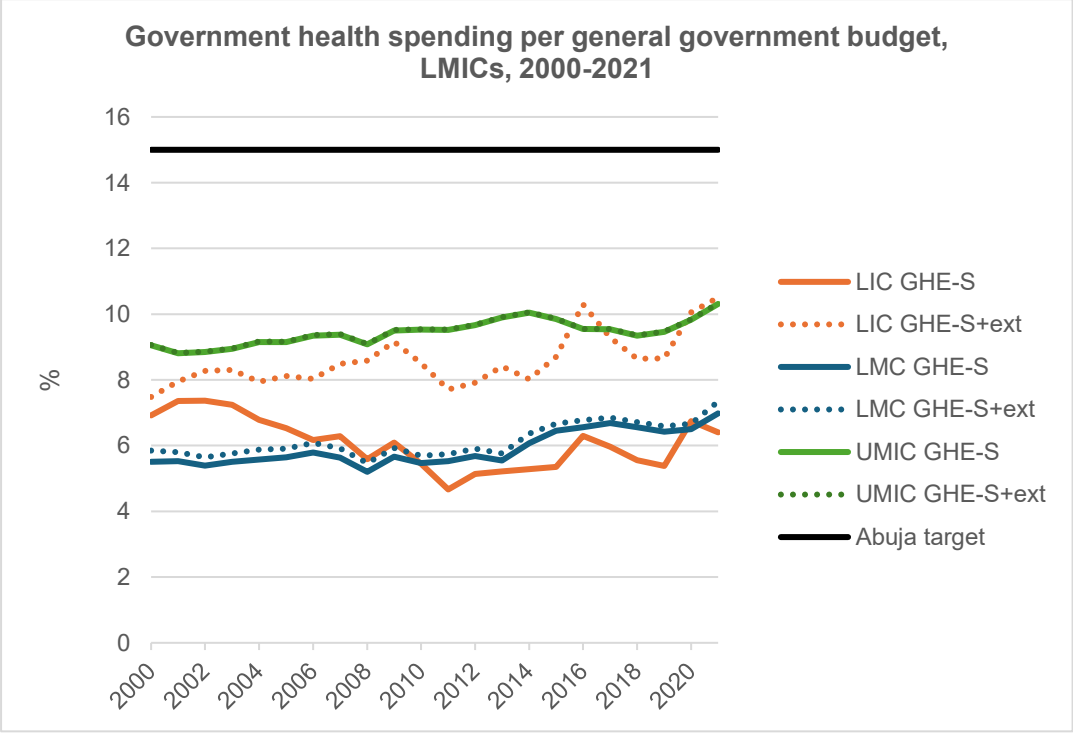

Figure 2.3: Solid lines: Government Health Expenditure as a Source (GHE-S) as a fraction of General Government Expenditure (GGE); Dotted lines: GHE-S + external transfers distributed by government (on-budget development assistance for health), in Low- and Middle Income Countries (LMICs), 2000-2021 (27). Levels are compared to the Abuja target of 15% government health spending (both domestically and externally derived) / GGE (45).

Funding levels also fall short of the so-called “Chatham House goal” set by Di Mcintyre and Filip Meheus that GHE-S levels in LMICs should be at least 5% of Gross Domestic Product (GDP) to make progress towards Universal Health Coverage (UHC) (27, 41, 43) (Figure 2.2).

The level of GHE-S that a government spends depends on two key fiscal factors: A) public revenue from domestic sources, i.e. the total amount of money a government raises (excluding grants from external sources), and B) the proportion of this revenue that is spent on health. Concerning the first factor, based on WB data, average LMIC public revenue estimates (excluding grants) have fluctuated between 15-20% of GDP since 2005, compared to High-Income Country (HIC) figures between 24-27% (46). However, these levels vary substantially across countries, with Western economies such as Norway, Denmark and France raising between 40-50% of GDP as public revenue, and Sub-Saharan African (SSA) LICs such as Uganda, Malawi and Burkina Faso raising between 12-18% of GDP as public revenue (46). As for the second factor, the proportion spent on health, GHE-S as a proportion of General Government Expenditure (GGE) was lower in 2021 (6.4%) than in 2000 (6.9%) for LICs (Figure 2.3). For LMICs, improvement has been seen from 5.5% in 2000 to 7% in 2021, and in UMICs from 9% to 10.3%. In comparison, HICs have spent a median 12-15% of GGE on health, or 4-6% of GDP over the same time period (27). Again, these summary figures hide the inequality between global spearheads of government funded healthcare such as Sweden, Canada or the United Kingdom that spend 18-20% of GGE as GHE-S, or 7-10% of GDP, compared to the ten lowest-spending LICs that spend 2-4% of GGE as GHE-S, or less than 1% of GDP on health (27).

2.2. Development assistance definitions, terminology, levels and trends

2.2.1. Official Development Assistance

The main functions of international official donors and creditors are to give grants and loans. The main official international financial flows from HIC governments, multilateral organizations and private philanthropies to governments and Non-Government Organizations (NGOs) in partner LMICs are: Official Development Assistance (ODA), which is given either as grants or as concessional loans, and non-ODA loans given on non-concessional terms. Grants from private foundations are also reported in the Organisation for Economic Cooperation and Development (OECD) Creditor Reporting System (CRS) database as private financing, not as ODA (47).

Since 2018, ODA has been defined by the OECD Development Assistance Committee (DAC) as flows with a development purpose which are "*concessional in character"*. This implies a grant element of:

- **"*45 per cent*** *in the case of bilateral loans to the official sector of LDCs* [Least Developed Countries] *and other LICs (calculated at a rate of discount of 9 per cent).*
- ***15 per cent*** *in the case of bilateral loans to the official sector of LMICs (calculated at a rate of discount of 7 per cent).*
- ***10 per cent*** *in the case of bilateral loans to the official sector of UMICs (calculated at a rate of discount of 6 per cent).*
- ***10 per cent*** *in the case of loans to multilateral institutions … (calculated at a rate of discount of 5 per cent for global institutions and multilateral development banks, and 6 per cent for other organisations, including sub-regional organisations)"* (48).

Before 2018, the OECD definition of ODA was flows with a development purpose which were "*concessional in character and convey*[ed] *a grant element of at least 25 per cent (calculated at a rate of discount of 10 per cent)*" (48). Concessionality is defined by the OECD DAC as a measure of credit softness reflecting "*the benefit to the borrower compared to a loan at market rate*" (49). This relies on the grant element. The grant element is calculated as "*the difference between the face value of a loan and the discounted present value of the service payments the borrower will make over the lifetime of the loan, expressed as a percentage of the face value*." (49). This in turn depends on the interest rate (% per year), grace period (time from loan commitment until repayments have to start), maturity (time from commitment until last repayment has to be made) and the discount rate as per above (49). As an example, a loan provided via the World Bank (discount rate: 5% per year) with an interest rate of 4% per year, a grace period of 5 years, and maturity of 30 years, has a grant element of 10.9% and is therefore considered concessional (50).

The term Official Development Assistance^{+} (ODA^{+}) for health is used in this research, a term which has previously been used by Countdown to 2030 to capture ODA and Bill and Melinda Gates Foundation (BMGF) grants for health purposes due to their magnitude (51). The Institute for Health Metrics and Evaluation (IHME) use the term Development Assistance for Health (DAH), which includes private donations from individuals and corporations (52). As this research looks at official development partner activities, it generally uses the terms ODA for health purposes and ODA^{+} for health with BMGF grants included, and generally relies on ODA data from the Organisation for Economic Cooperation and Development (OECD) Creditor Reporting System (CRS) database to examine official development partner financial

assistance (47). The terms “development assistance for the health sector” and “external health financing” are used to broadly refer to externally derived transfers for LMIC health sectors when the use of less specific terminology is more appropriate.

2.2.2. Development assistance levels and trends

According to OECD CRS data, in 2022, gross total ODA was about US$ 277 billion per year (current US$) (47). $203 billion were disbursed as grants, and $72 billion as loans. Out of total ODA, approximately $39 billion were channelled to health purposes[4]. Both total ODA and ODA for health purposes have grown substantially over the recent decades. The latest increases seen since 2020 were to a large extent due to increased financing to help countries cope with the Covid-19 pandemic and funds allocated to receive refugees from Ukraine in donor-countries (47, 53, 54).

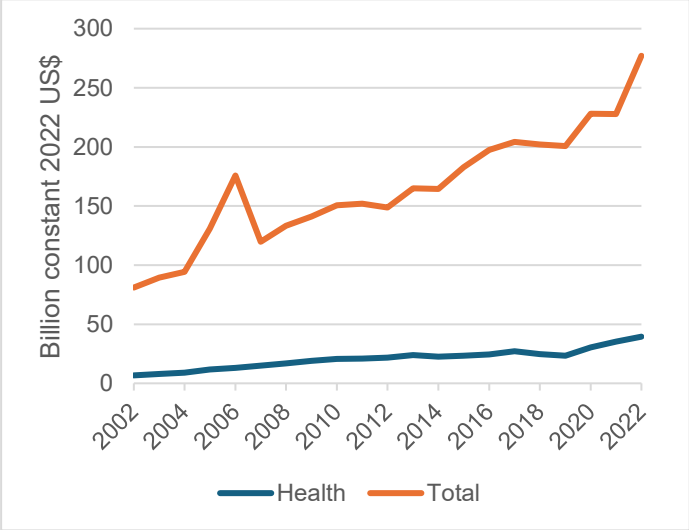

Figure 2.4: Total disbursed ODA and ODA for health purposes from 2002-2022 (47).

2.3. Debt terminology, levels and trends

2.3.1. Debt terminology

LMIC governments generally borrow from other government credit/development agencies bilaterally, International Financial Institutions (IFIs) – including the WB and the IMF, but also regional development banks such as the African Development Bank and Islamic Development Bank - other multilaterals and international private creditors, such as commercial banks or individual bondholders. Some of the bilateral and multilateral official lending may count as concessional and thereby as ODA as per above, while the rest is considered non-concessional.

[4] Calculated by adding categories 120: “Health, total” and 130: “Population Policies/Programmes & Reproductive Health, Total”.

2.3.2. Debt levels and trends

The Public and Publicly Guaranteed (PPG) external debt stock held by LMICs has grown from about $1.1 trillion in year 2000 to about $3.4 trillion in 2022 (current US$) (46) (Figure 2.5). Debt servicing levels have grown accordingly, with LMIC governments repaying about $414 billion towards these loans in 2022, about US$137 billion more than funds received as ODA (46, 47). In the 1990's and 2000's, the Heavily Indebted Poor Countries (HIPC) and Multilateral Debt Relief Initiative (MDRI) led to substantial debt relief for the most indebted LMICs, with an absolute decrease in the PPG external debt stock (46, 55). With corresponding strong GDP growth rates, the debt stock plummeted relative to GDP (46) (Figure 2.5). This trend however reversed during the 2010's as countries completed the HIPC and MDRI schemes, kept accumulating debt, and GDP growth rates slowed.

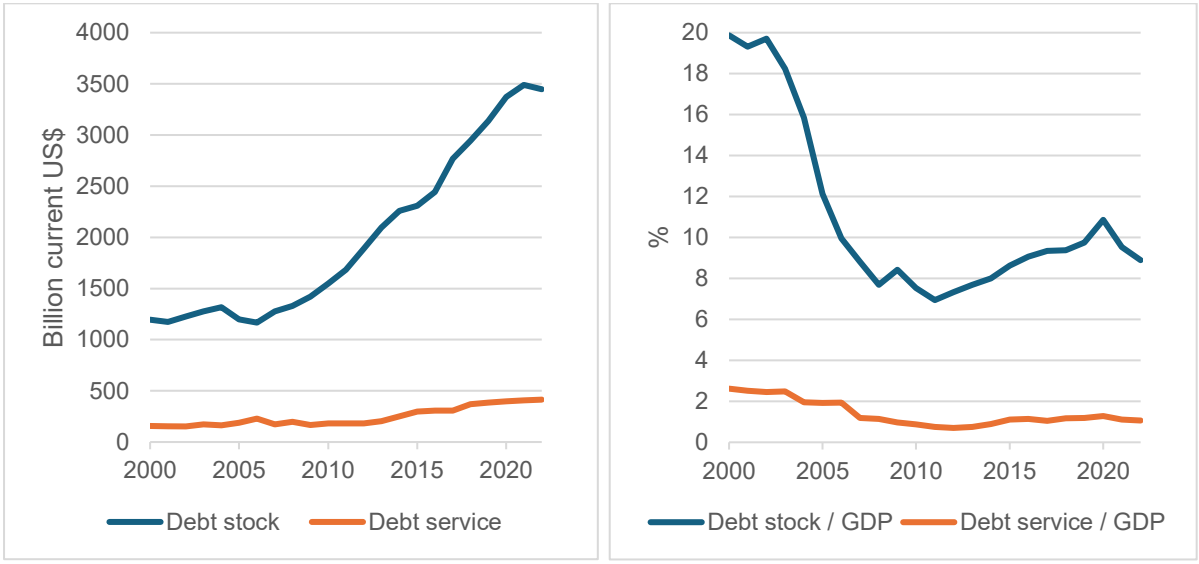

Figure 2.5: PPG external debt stock and service in LMICs from 2000-2022 in absolute terms and relative to GDP (46).

These aggreggate figures conceal a strong disparity in debt burdens between countries. 25 of the most indebted LMICs spend more than a fifth of their tax revenue on external debt servicing, and 55% of Least Developed Countries (LDCs) and other LICs are assessed as being at high risk of, or in, debt distress (2024 UN analysis based on 2023 data) (53).

2.4. IMF/WB mandates, programmes and loan conditionality terminology

The International Monetary Fund (IMF) has as its mandate to promote international monetary cooperation and financial stability, including for exchange rates and balance of payments, and encourage the expansion of trade, economic growth and prosperity of its member countries (56, 57). It does so by providing loans/credit and policy/technical advice and assistance (56).

The majority of IMF loans and credit are non-concessional, while funds disbursed through the IMF Concessional Trust Fund count as ODA (47).

Two of the World Bank Group's branches provide loans to governments: The International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA) (58). The mandate of the IBRD is to invest in capital for productive purposes, promote private foreign investment, economic growth and trade, improving living standards and labour conditions in its member countries, with an emphasis on economies disrupted by war and "less developed countries" (59). The IDA has as its mandate to promote economic development, increase productivity and raise living standards also in less developed countries, on terms more flexible and concessional than the IBRD (60). The WB provides non-concessional loans to Middle-Income Countries (MICs) via the IBRD (61), and concessional loans and grants to LICs and eligible LMCs via the IDA (62). The WB also functions as a global knowledge bank, offering policy advice, data, research and analysis, and technical assistance (63).

2.4.1. Programme/mechanism terminology

The IMF and WB have a number of different lending facilities, financing mechanisms and country support programme types. These have changed over time. In the 1980's and 1990's their main programs were the Structural Adjustment Programs (64, 65). Following extensive criticism over the social implications of structural adjustment, the IMF replaced their structural adjustment facility with the Poverty Reduction and Growth Facility (PRGF) in 1999 (66). The WB and IMF now required country governments to develop comprehensive multi-sectoral Poverty Reduction Strategy Papers (PRSPs) for lending eligibility (67), which are still used today. In 2024, the IMF had 12 different lending facilities (68). Using different criteria and terms of lending, these facilities provide access to three different accounts. A) The General Resources Account (GRA), which has non-concessional terms with market-based interest rates (68). B) The Poverty Reduction and Growth Trust (PRGT) for low-income countries at low/zero interest rates (68). C) The Resilience and Sustainability Trust (RST) established in 2022 for addressing longer-term challenges such as climate change in low-income-, lower-middle income- and small states, with tiered and varying interest rates roughly between 0.6% to 5.2% (68-71).

2.4.2. Loan conditionality terminology

While all loans have general terms of lending (interest rate, grace period, maturity period etc.), IMF and WB loans come with particular policy recommendations and loan conditionalities (72, 73), which forms a central argument for focusing on these two creditor institutions in this research. IMF conditionality may take the form of "prior actions", "structural benchmarks",

“quantitative performance criteria” and “indicative targets” (72). Prior actions and quantitative performance criteria are binding conditions, meaning they are mandatory for initiation or continuation of the IMF programme (72, 74). Prior actions are structural steps a borrower country agrees to take before the IMF will approve financing or complete a review, e.g. measures to increase revenue (72, 74). Quantitative performance criteria are quantitative conditions for IMF lending such as a ceiling on the public external debt (72, 74). Structural benchmarks are non-binding, non-quantitative progress indicators such as “strengthening tax administration” or “reforming state-owned enterprises” (72, 74). Indicative targets are non-binding “flexible numerical trackers”, used for monitoring a country’s progress toward agreed upon economic adjustment objectives, e.g. placing a particular quantitative ceiling on the government wage bill (72, 74).

Through its Country Partnership Framework (CPF), the WB similarly sets out conditionalities upon which access to its lending and policy/technical advice depends (75, 76). The WB only counts legally binding conditions under the term loan conditionalities, which includes “prior actions” before a programme can begin, and “tranche release conditions” necessary for the release of funds, both of which are structural conditions as opposed to quantitative conditions (75-77).

Having established the key concepts and terminology for this research and levels and trends of examined variables, Chapter 3 presents the results of a review of the existing literature on the research questions and explains the economic hypotheses and conceptual framework for the research as informed by the literature. Chapter 4 describes the research methods used in this thesis and its associated epistemological position.

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3. Chapter 3: Literature review, hypotheses and conceptual framework

This chapter provides an overview of the literature underlying the research in this thesis. This is organised according to the different dimensions of the research questions and the economic relationships investigated. It first summarises available theoretical policy influence analysis frameworks, and the literature on External Development Partner (EDP) influence on Low- and Middle-Income Country (LMIC) health financing. It then summarises the literature on the relationships between: Official Development Assistance (ODA), debt variables, International Monetary Fund (IMF) programmes and loan conditionalities, and government health spending, voluntary health insurance schemes and out-of-pocket financing. It then identifies some of the literature gaps sought to be addressed by this thesis, explains the economic hypotheses to be explored and the conceptual framework guiding this exploration based on the reviewed literature.

The methods used for reviewing the literature are described in Appendix 1.

3.1. Theoretical policy influence analysis frameworks

There are a number of frameworks available for thinking about and analysing how policy influence occurs more broadly. Among the better known of these is Kingdon's streams model (1), with streams of problems, politics and policy that come together in a policy window, through which policy happens, which also identifies how policy can be influenced via these streams and windows. Walt and Gilson's (1994) policy triangle model was specifically developed in the context of analysing the political economy of health policy reform in LMICs, highlighting the roles of context, policy content, policy process, and actors (2). The linear model of policy-making by Meier (1991) emphasised the influence from state-centred and society-centred forces on policy makers in the policy process, hence focusing on different groups of actors (3). A commonly used framework in the health financing policy process literature is the Stages model by Grindle and Thomas (1991), which depicts the policy making process as an algorithmic, linear process from an issue being on the agenda, a decision for reform being made, to successful implementation of a policy (4, 5). While this framework does not directly incorporate external actors, and real-world policymaking is likely more dynamic, it does identify junctures where EDPs can exert influence. The "3-i's" framework conceptualises how ideas, interests and institutions jointly form the basis for policy change, looking more at the "why" of policy change than the "how" (6-8). The "context, evidence, links" framework identifies key factors for policy influence as the political context, the evidence-base underlying a policy, and links/network factors, as well as external socio-economic/cultural factors (9-11).

Some authors have emphasised the agents of policy change, i.e. the actors, coalitions and policy communities that can influence policy (12). Others emphasise the mechanisms through which policy influence happens, which relates more directly to the research questions posed in Chapter 7, and includes the mechanisms of advice, lobbying, advocacy and activism (10, 13, 14).

Relating more directly to the influence of EDPs on LMIC governments is the Spheres of Influence Framework, that articulates how "bilateral activism" occurs via international science and finance, grounded in underlying political ideas, in an interaction with recipient country political resources and policy culture (15). On policy advice as a mechanism of EDP influence in development cooperation, Haldenwang and Anker (2009) distinguish between policy advice that is more scientific and politically neutral, and types of policy advice that are more political (16). Specifically for analysing the political economy of health financing reform, Sparkes et al. (2019) have developed a framework that includes the role of external politics, however without specific formalisation of external influence mechanisms on domestic health financing sources (17). Fox and Reich (2015) instead used a combination of Hall's 3-i's framework (6) and Kingdon's stream model (1) as a comprehensive theoretical framework for analysing how politics affects UHC reform in LMICs at different stages of the policy cycle (18, 19), though again without a specific formalisation of EDP influence on different health financing sources. On the World Bank (WB), Bazbauers (2017) described how the transfer of international norms, ideas and practices occurred via WB technical assistance, shaped by the political and social relations that surround them (20).

3.2. EDP influence on LMIC health financing

Several studies have investigated EDP influence on LMIC health financing. Most of the identified literature examines EDP influence on health financing reform such as the introduction of national health insurance schemes, introduction or removal of user fees, or piloting new health financing schemes in aid-recipient countries, while others have examined influence on domestic health financing allocations. This literature is predominantly qualitative, using methods including literature/document reviews, policy and stakeholder analysis, key stakeholder interviews and participant observation.

3.2.1. EDP influence on health financing reform

The existing literature has identified influence from EDPs+IMF on user fees, from earlier promotion especially by IMF/WB in the 1980's and 1990's to later promotion of user fee exemption schemes. In the 2000's EDPs have promoted national health insurance schemes and Community Based Health Insurance (CBHI) in different contexts. In terms of their used

mechanisms of influence, EDPs are generally found to provide technical and financial support to health financing reform.

In Ghana, the "cash-and-carry" system of paying user fees for health services was described as "*constructed by the IMF and the World Bank in the 1980s*"[5] - a notion supported by other authors (21). The IMF and WB later changed their position along with other partners in the 2000s in favour of a nationwide health insurance scheme (22). Donors were then found to use their financial leverage and technical expertise to gain access to health policy agenda-setting, highlighting the role of UNICEF in promoting fee exemption for maternity care (23). In Liberia, the positions of international humanitarian NGOs against user fees was also viewed as influential in the government's decision to suspend user fees, hoping to retain their partners (24). In Uganda, EDPs were described as wielding "*formidable political power to influence the health policy process*" in 2004 (25), originally in support of user fees, informed by the 1987 WB report: "Financing Health Services in Developing Countries", up until the abolition of user fees in 2001 (25-27). A 2017 review of the literature on government ownership of Universal Health Coverage (UHC) policy decisions in Sub-Saharan Africa (SSA) found that governments had varying levels of ownership, which was found to more often be due to private sector influence than donor influence. Donors and governments were then often seen to work hand-in-hand, e.g. in designing user fee exemption policies (5).

EDPs have been found to give technical and financial support to the development of the national health insurance scheme in Nigeria (28), and later advocated and provided technical and financial support for the Nigerian basic health care provision fund (29). EDPs have also been acknowledged as influential in health financing reforms in Zimbabwe (30, 31) and Uganda (25, 27, 32). In Pakistan, EDPs were described by the World Health Organisation (WHO) and Ministry of Health staff as having provided technical assistance in the development of national health financing reforms for UHC (33). Investigating the formation of a migrant health insurance scheme in Thailand, Herberholtz (2020) found that while finance and technical expertise were found to be mechanisms of influence at different stages of the policy process, intersectoral leverage instrumentalised as international reports and rating/carding systems applied to export sectors with potential harmful economic and reputational effects, were found to be much more influential (34).

[5] As explained in Chapter 1, the IMF technically cannot be classified as an EDP, but the quote mentions both IMF and WB, and the study most appropriately fitted under an EDP influence subheading.

The value of EDPs in providing financial and technical assistance to the piloting and scale-up of CBHI has been described in Ethiopia (35), a value noted by other researchers (36). Po et al. (2010) praised EDP-supported pilot projects of new health financing schemes, leading to the nationwide scale-up of health equity funds in Cambodia (37). Evidence from Tajikistan however showed how EDP-supported pilots can also be incoherent and ineffective in supporting health financing reform in the absence of strong donor coordination and harmonization (38).

Other authors have critiqued how CBHI has been pushed by EDPs in Senegal, allegedly stifling progress toward UHC by more than a decade, which was attributed to poor coordination and inherent equity issues with CBHI compared to other modes of pooled health financing (39, 40).

3.2.2. EDP influence on domestic health financing allocations

While not the focus of this thesis, EDPs have also been found to influence domestic health financing allocations in terms of the disease areas receiving government health budget priority.

In the 2000's and early 2010's, a study by Nagemi et al. (2021) found that vertical donor financing priorities took precedence over the Ugandan government's priorities, crowding out government health financing allocations to donor-prioritised disease areas (41). In the MDG era, high EDP prioritisation and financing for HIV/AIDS was found to converge with a disproportionately high government budget allocation to this disease relative to its disease burden in Brazil and India, but not Russia (42). A case study from Uganda has highlighted the importance of fiscal space and fiscal policy frameworks allowing for additional health funding being allocated to donor priorities: In 2002, Uganda was awarded a grant from the Global Fund to Fight AIDS, TB and Malaria (GFATM) on condition of matched funding from the domestic health budget, however the Ugandan public budget was fixed for three years in a Medium-Term Expenditure Framework (MTEF) agreed upon with the IMF (43). This study illustrates an intersection between our different actors and their activities, in this case an EDP seeking to mobilise additional domestic resources for health, allocated toward their priorities, and IMF fiscal policy frameworks preventing this. Another study from Uganda has also shown the role of EDPs in co-determining health financing allocations, with EDPs prioritising disease-specific targets rather than broader health system strengthening as envisioned in the national development plan for the health sector (44).

Co-financing requirements from EDPs, e.g. Gavi, can also help mobilise additional government funds for different health programs (45, 46). Jha et al. (2024) have highlighted the

necessity of matched funds being net additional to avoid displacement from other social sector priorities (45).

The following sections summarizes the literature examining the relationship between ODA and domestic health financing, which is predominantly quantitative studies.

3.3. Development assistance for the health sector and sources of domestic health financing

3.3.1. Development assistance for the health sector and government health expenditure

The association between development assistance for the health sector and Government Health Expenditure (GHE) is described mainly in a body of literature centered around fungibility. Fungibility in this context refers to when development assistance for the health sector does not translate into a 1:1 net addition of funds due to a reduction in domestic government health expenditure resulting from having received these external funds for health (this is also referred to in the literature as “displacement” or “crowding out”) (47-49). The general concept of fungibility is a well-known and acknowledged phenomenon in the general development assistance literature (50-56).

15 original panel data studies of associations between GHE and development assistance for the health sector were identified, published between 2009-2021 (48, 49, 55, 57-68) (see Appendix 1 for details). Panel sizes varied between 9 and 143 countries and time-periods between 1980-2015. Development assistance data sources used were the Organisation for Economic Cooperation and Development (OECD) Creditor Reporting System (CRS), WHO National Health Accounts (NHA), Institute for Health Metrics and Evaluation (IHME) and the WB. Health financing data came from the IMF and WHO NHA databases (the latter is available as the WHO Global Health Expenditure Database (GHED)). Measures of development assistance for the health sector varied considerably, with some studies disaggregating this into development assistance channeled via the government and others not. For GHE, some studies measured Government Health Expenditure as Agent (GHE-A, which is the same as GHE) while others narrowed to GHE-S (i.e. from domestic revenue) as the dependent variable. Estimation methods used included Ordinary Least Squares (OLS), Generalized Least Squares (GLS), Fixed Effects (FE) models and Generalized Method of Moments (GMM).

Results varied greatly. One study found an additional 50 cents per capita being “crowded in” from domestic resources for every $1 of development assistance for the health sector per capita received (57). Another found near complete fungibility: -$0.86 GHE-S spent for every $1 Development Assistance for Health channeled via Government (DAH-G) received (65). In total, eight studies found evidence of a decrease in government health spending (GHE-S/A (per Gross Domestic Product (GDP))) of more than 10% of the increase in development assistance for the health sector (total or channeled via government (/GDP)) (48, 49, 58-60, 64, 65, 67). Five studies found evidence of an effect size less than this or reported “little if any fungibility” or “little or no evidence of displacement” (55, 62, 63, 66, 68) (3 negative and two positive direction of effect), and two studies found evidence of an increase in government health spending of more than 10% of the increase in development assistance for the health sector (57, 61). While estimates varied greatly between the reviewed studies, 11 out of 15 studies indicated a negative direction of the association between receiving development assistance to the health sector and GHE, so in total, the literature supports the hypothesis of the presence of fungibility more than the hypothesis of the contrary. The observed variability between studies may to a large extent be due to the different methods described above.

3.3.2. Development assistance for the health sector, Out Of Pocket payments and Voluntary Health care Payment Schemes

The quantitative literature on associations between development assistance to the health sector and Out Of Pocket payments (OOP) and Voluntary Health care Payment Schemes (VHPS) is scarce and does not provide any solid indication of a clear, general relationship. The six following empirical studies were identified:

Xu et al. (2011) found that a 1% increase in external health financing was associated with a 0.03-0.06% increase in OOP in lower-middle income countries, with no significant association in LICs and UMICs (60).

Younsi et al. (2016) found OOP to increase by between 0.01-0.04% (depending on model specifications) for every 1% increase in development assistance for the health sector in LMICs (67).

Ali et al. (2020) found that neither overall Official Development Assistance (ODA) or ODA for the health sector per capita affected OOP measured as a proportion of private health spending in SSA between 1995-2015 (69).

Frimpong et al. (2022) examined the effects of external health spending on OOP using System GMM on data from 43 SSA countries from 2000-2017 and found a significant negative relationship (elasticity -0.06 to -0.09) (70).

Based on household survey data from 65 LMICs receiving above-average DAH per capita from 2000-2016, Gabani et al. (2024) found no overall association between DAH per capita

and OOP being larger than 10% of total household spending, OOP per total household spending, or impoverishment due to health expenditure. When channelled via the government however, significant negative associations were seen with most outcome variables, i.e. improved financial risk protection (71).

Patenaude (2021) found a significant positive relationship between DAH-G and prepaid private health financing (0.6$ increase in prepaid private for $1 increase in DAH-G) in some model specifications but not others, and not with OOP, and he found no association between Development Assistance for Health via Non-Governmental channel (DAH-NG) and these outcome variables[6] (68).

In a panel study of 154 countries from 2000-2015, including HICs, Leiter and Theurl (2021) found no significant association between DAH per capita and voluntary prepayment as a percent of total prepaid health financing[7] (74).

3.4. Non-health development assistance and government health spending

Three studies also looked at the effects of development assistance to other sectors than health on government health spending. By disaggregating concessionary loans ear-marked for different sectors using World Bank and IMF data from the 1970's and 80's across 38 LMICs, Feyzioglu et al. (1998) found that loans to the transport and communication sector stimulated public spending on health, thereby providing evidence for intersectoral fungibility benefiting the health sector (75). However their findings for loans given to the health sector were insignificant.

Using Fixed-effects IV estimation for a panel of 45 SSA countries from 1995-2015, Ali et al. (2020) found no effect of overall ODA received per capita on government health expenditure as a share of GDP (69).

A cross-sectional study of 2001 data from 44 African countries using OLS and robust least absolute error estimation found that "foreign aid" per capita correlated positively with "real per-capita health expenditure"[8] (76).

[6] It deserves mention that the majority of his Hansen-tests have a p-value of the implausibly high number 1.000 ((72)), i.e. the models are in all likelihood overspecified and suffer from instrument proliferation (73), and the remainder have a P-value of 0.000, i.e. reject the null-hypothesis that the generated instruments are valid (73). No reference to the number of instruments generated or efforts to limit them is reported. Some of these results also suffer from serial correlation in the levels equation, and trusting the validity of these findings is therefore difficult.

[7] In dynamic models.

[8] Foreign aid interpreted as total ODA but unclear what was included in this variable. Also unclear which types of health expenditure were included in the dependent variable. A caveat applies for using correlational evidence from OLS for causal inference, in particular for relatively small panel and one year of data.

A single-country case study of Ghana from 1980-2014 using 3SLS found that increases in ODA were associated with increases in GHE/GDP[9] (77).

3.5. Public External Debt and Domestic Health Financing

3.5.1. Public External Debt and Government Health Expenditure

A few studies have examined the associations between debt and government health spending, with more studies finding evidence for a negative relationship between indebtedness and government health spending than the contrary.

Liang et al. (2014) investigated the associations between general Government Gross Debt (GGD: All government debt i.e. including both internal and external government debt) and GHE and GHE-S in LMICs between 1995-2010. They found a 1% increase in per capita GGD to be associated with a 0.27% increase in GHE, and a 0.10% increase for GHE-S (66).

Fosu (2007) looked at public expenditure shares in a panel of 35 African countries from 1975-1994 (78). He found that a one-standard deviation in public external debt servicing was associated with nearly one-third reduction in the share allocation to the health sector. A one-standard deviation increase in ODA/GDP was associated with a much smaller increase in the share allocation to the health sector, and this small responsiveness was found to be "*indicative of considerable fungibility of aid"* (78). The author found that debt relief would be more effective at increasing social sector funding allocation than aid (78). He also found a strong negative effect of predicted debt servicing on government health spending in a follow-up study (79).

Lora and Olivera (2006) studied a panel of about 50 LMICs between 1985-2003 and found higher public debt to reduce social spending, an effect that was attributed mainly to the stock of debt as opposed to debt service payments, which was interpreted as due to governments not desiring to take on more debt than they already had outstanding (80).

In a selected panel of seven South and Southeast Asian countries from 1980-2010, Shabbir and Yasin (2015) found a 1 percent increase in debt servicing to be associated with an 0.25% decrease in social sector spending (81).

Behera et al. (2019) found both significant positive, negative and insignificant associations between overall government debt servicing on government health expenditure in a panel of 85 LMICs from 2000-2013, based on which time period and countries were included (82). The relationship was significantly positive before the 2008 financial crisis, significantly negative after, insignificant in LICs, and significantly negative in MICs[10].

[9] Unclear if external contributions via government were excluded, which would explain positive correlation due to double counting.

[10] Likely issues with overspecification and instrument proliferation as all Sargan test p-values 1.000, and Hansen-test should be reported for two-step system GMM (72, 73). No mention of instrument numbers or efforts to curtail

Patenaude (2021) included general government debt per GDP as a covariate when analysing the impacts of DAH on the different main sources of domestic health financing (GHE-S, prepaid private health expenditure and OOP), and found a significant negative relationship between general government debt per GDP and GHE-S, and no relationship with prepaid private health spending and OOP[11] (68). Similarly, Lahiani et al. (2022) used system GMM to find that total government debt per GDP correlated negatively with total government health spending per GDP, and a separate negative effect of episodes of fiscal consolidation, in a selected panel of 23 "emerging" and middle-income countries from 2009-2018 (83).

In a case study of Senegal, Ouattara (2006) modeled the relationships between aid, debt and overall public spending between 1970-2000 (84). He found that 41 percent of aid disbursements and 14 percent of Senegalese government revenue had been used to repay debt, a negative elasticity of -0.13 between debt service increases and domestic expenditure as a share of GDP, and no significant elasticity between aid and domestic expenditure. He concluded that his findings indicated that reducing public debt in Senegal would be a more effective tool for increasing domestic expenditure than additional aid, making analogous inferences for health and other social sectors though without specifically disaggregating their spending (84).

A discussion paper by Kimalu (2002) examined national trends in Kenya, noting increasing debt stocks and -servicing throughout the 1980's and 90's, lowered government health expenditure per capita over the same period, and worsening public health indicators during the 1990's (mainly driven by the HIV/AIDS epidemic). The author argued that "*Kenya handles its external debt and its regular servicing at the expense of such vital life programmes as health care, education, and other social services*"[12] (85). Another discussion paper from Kenya has also used descriptive statistics from 2019-21 in Kenya, Zambia and Nigeria to argue that debt constrains government health spending in these countries (86). Also from Kenya, an Oxfam case study has used interviews, focus groups and national-, county- and household level statistics to explore debt impacts on the health sector including government health spending, concluding a constraining effect on the latter (87).

A WB discussion paper from 2022 projected that debt interest repayments are expected to limit government health spending per capita across LMICs until 2027 (88). 2023 analyses by the Center for Global Development (CGD) highlighted sharp increases in LMIC government interest repayments and that these were likely to constrain overall public spending, including for health sectors (89, 90). Similar conclusions were made by Birungi et al. (2022) for

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them. Possible serial correlation in the levels equation for some regressions. Therefore caveats for trusting the validity of these findings.

11 Findings subject to the caveats described in Section 3.3.2.

12 Caveat: It is not possible to claim causality, effects, impacts or any other such terms based on a description of trends.

G20 Debt Service Suspension Initiative-participant countries (91).
Debt crises have also been found to negatively affect both government social and health spending across a panel of 108 LMICs from 1991-2019 (92).

3.5.2. Public External Debt, Out Of Pocket Payments and Voluntary Health care Payment Schemes

Only two studies were identified investigating these relationships. They included OOP as a dependent variable, not VHPS.
Said and Sani (2020) found a significant negative relationship between the public debt burden and OOP in 43 SSA countries from 2000-2014 in a robustness check, however the exact variables or regression outputs were not reported for this association (93).
Patenaude (2021) found no significant relationship between general government debt per GDP and OOP (68).

3.6. IMF programmes, loan conditionalities and domestic health financing

The literature investigating the links between IMF loan conditionalities and domestic health financing is roughly divided into two camps: one camp consisting of academics and civil society organisations finding that IMF conditionalities constrain domestic government health spending, and another of IMF/WB staff that find no constraining effect, or that government health spending increases under IMF programmes. There are methodological issues with the publications from both groups (described in Appendix 1), and some of the literature on both sides is not externally peer-reviewed, i.e. both IMF and civil society reports. The literature applies both qualitative and quantitative methods, some are policy analyses and others editorials/opinion pieces. Econometric studies of IMF effects on government health spending are characterized by significant heterogeneity in data used, specification choices, estimation methods, with corresponding divergence of findings, particularly between the described camps. The econometric literature is summarised in the below paragraphs, while further details are provided in Appendix 1.

Among the first group of academics and civil society, policy analyses and opinion pieces have proposed that IMF fiscal policy conditionalities under Structural Adjustment Programs (SAPs), Medium Term Expenditure Frameworks (MTEFs) and Poverty Reduction Strategy Papers (PRSPs) - the new name after the period of structural adjustment for the fiscal policy plans necessary to qualify for loans or debt relief from the IMF/WB - directly constrain government health sector spending through various mechanisms. These mainly revolve around austerity measures, including setting sectoral spending targets (94) (opinion piece), and public wage

expenditure ceilings (95, 96) (opinion piece/editorial; mixed-methods empirical study) motivated by the need to meet certain macro-economic targets such as specific levels of inflation (95), but also indirectly through allegedly undermining domestic industrialization and thus the tax base for health expenditures (97) (opinion piece). Critical analyses of IMF-driven austerity effects constraining social/health spending are numerous (43, 94-96, 98-115) (this includes a range of empirical work using both quantitative (including panel data studies) and qualitative methods identifying constraining effects, policy analyses and opinion pieces). Some nuances have been found in quantitative empirical work such as differential health spending effects in democracies vs. non-democracies (107), between different regions (116), between IMF programme participation and loan conditionalities (117), or no effect of IMF conditionalities on government health spending (77) (see Appendix 1 for details).
Decentralization and privatization reforms of the Mexican health sector in the 1980's is another example of health sector reform resulting from IFI programmes and their conditionalities (118) (policy analysis study).

While much of the above criticism and findings of constraining effects on social/health spending relate to austerity policies of the 1980's, 90's and early 2000's, policy analyses and quantitative empirical studies have continued up until today and found that while the IMF itself may claim to have learned from the adverse social impacts of imposing austerity measures on poor countries via SAPs, little has changed over time (99, 109-112). Change has however been identified in qualitative and quantitative text analyses of the evolution of WB policy over time, signifiying a transition from more dogmatically neoliberal/Washington Consensus policies before the turn of the millenium towards increasing focus on pro-poor social policy (119, 120).

On the side of the International Financial Institutions (IFIs), the former WB vice president for Africa, Callisto Modavo, commented in an interview study that "*The resources that could be used for education and health are being used for debt servicing*" (121). A 2007 Center for Global Development working group report, authored by three WB staff members and one retired IMF staff member, however arrived at a number of ways in which the IMF may have constrained health spending in poor countries (98). These admissions are in stark opposition to the working papers and commentaries by IFI staff, who have rejected the validity of studies finding negative associations between IMF policy and health spending (122) (commentary), and defended the protection of the health sector from austerity measures or even increased health spending in IMF-programme countries as compared to non-IMF programme countries (122, 123) (commentary and panel data study). A number of panel data regression analyses and descriptive statistical analyses conducted by IMF and WB staff have had similar findings

providing empirical support to this position, including from the IMF's Independent Evaluation Office (IEO) (124-132).

No studies were identified investigating associations between IMF programmes or their conditionalities and OOP or VHPS.

3.7. Literature gaps

As illustrated, there is a considerable body of literature on the influence of EDPs on health financing policy in LMICs. However, a number of gaps, scarcities and limitations in the literature are identified in the following areas: exploring different mechanisms of influence used; IMF/WB policy influence on domestic health financing at the country level; influence of development assistance to the health sector on OOP and VHI; non-health ODA effects on domestic health financing; debt effects on domestic health financing; effect of IMF programs and conditionalities on OOP; comparing effect sizes of both aid, debt and IMF conditionalities on government health spending in the same model. There are also methodological limitations and quality issues in many of the existing econometric studies, and most of this literature is somewhat dated, relating to the MDG era and before.

Most of the identified literature sought to establish the role of EDPs in specific health financing reforms, at times allowing for establishment of *what* influence EDPs had and *why*. While some studies mentioned e.g. financial and technical support, no identified studies had as their primary focus an exploration of the *how*, i.e. the modes or mechanisms of influence, and a systematic unpacking of the mechanisms of EDP influence on the composition of domestic health financing sources is thus lacking in the literature. Addressing this question allows for a comprehensive and comparative analysis of the different pathways and directions of effect across different health financing sources, how they compare and relate, and whether there are areas of inconsistency or policy incoherence. The recent critical commentary from Senegal by Ridde et al. (2024) describing an external push for Community Based Health Insurance (CBHI) by EDPs (39) also motivates a broader empirical enquiry into the role of EDPs in determining the mix of health financing sources present in Senegal and considering equity implications hereof.

While the IMF and WB have faced substantial criticism for the effects of their policies on health financing in the 1980s-2000's, there are fewer recent analyses of their influence on health financing, and in particular a dearth of systematic, qualitative empirical enquiry at the country level. Much of the literature is quantitative, but with sectoral or nationwide policy recommendations and conditionalities, a qualitative approach exploring mechanisms of

influence and detailed policy content is also warranted. Aside from one study examining IMF policy documents for influence on GHE across 16 West African countries between 1995-2014, with brief mention of Senegal (96), a dedicated interrogation of IMF/WB influence on the different domestic health financing sources in Senegal is lacking in the literature. Given the generally highly influential position of these two organisations on fiscal policy in LMICs, and sectoral policy in the case of the WB, a such interrogation could help bring to light areas and mechanisms of influence that might co-determine health financing in Senegal. Such information would be relevant to national stakeholders in health financing, nonetheleast the Senegalese population as they would ultimately be subject to any influence identified. Lessons learnt could potentially also prove relevant for health financing stakeholders in other countries in the region and more broadly, and the IFIs themselves.

While there is a predominance of literature studying fungibility of development assistance to the health sector, the literature examining the relationship between development assistance to the health sector and OOP and voluntary health insurance is considerably scarcer.

There are very few studies that look at how non-health ODA affects health financing, although these intersectoral dynamics should be key questions for a comprehensive understanding of the domestic fiscal implications for the health sector of externally derived development financing.

Studies of how debt affects health spending are also rather limited and very heterogenous in study design, with some divergence of findings. Many of these studies look at general rather than external debt, and broad social spending. Only two studies have taken the step further to examine how government indebtedness affects the reliance on OOP health spending, however they have done so not as the primary research focus, but as covariates and in robustness checks, and not specifically investigating the role of public *external* debt. Apart from a 2002 discussion paper and a 2021 Oxfam case study both from Kenya (85, 87), no other single-country case studies of how debt affects health financing in their country were identified[13]. With the recent expansion of LMIC debt burdens, such questions at the country level are becoming increasingly pressing as more countries are seeing their fiscal space for providing social services threatened by growing debt obligations (88, 89, 133-135).

[13] Ouattara (2006) studied overall government spending, not health spending specifically (84).

As for the effects of IMF programmes and conditionalities on health spending, this quantitative literature has focused on effects on government health spending and not whether IMF programmes and conditionalites in turn translate into increased reliance on OOP.

The literature also lacks a comprehensive comparative analysis of the strengths and sizes of the different associations to be investigated, as no studies were identified that compared the effects of aid, debt and IMF conditionalities on health spending in the same model. Such a comparison allows for essential questions of "what matters more" - does aid shift domestic health financing in a particular direction more than debt repayments or vice versa[14]; are IMF conditionalities more important than aid and debt in determining reliance on a given health financing source, etc. Addressing such questions could help focus policy work where it matters most for expanding fiscal space for health and reducing dependence on user fees.

Most of the econometric literature is dated to the Millenium Development Goal era or before, and a new exploration of these relationships into the Sustainable Development Goal (SDG) era is needed.

The System Generalised Method of Moments (GMM) method is one of the newer tools in the econometric toolbox, and many of the cited researchers had to rely on older methods that suffer from more statistical issues, as described in this chapter and in the Methods chapter (Chapter 4). Using System GMM should help overcome some of these issues. A number of the cited studies also suffer from quality issues as described in the footnotes of this chapter, issues that are hoped to be addressed to the extent possible with the estimation approach presented in Chapters 4 and 6.

This thesis aims to address these knowledge gaps by using both global-level econometric methods and country-level mixed-methods to unpack mechanisms, directions and sizes of EDP+IMF influence on domestic health financing sources, enabling a joint interpretation and discussion of findings across methods and across the global/national level, providing original, evidence-based policy and research recommendations.

[14] Some authors have included ODA variables and debt variables in the same model, however without also including IMF variables (e.g. (68, 78)).

3.8. Hypotheses and conceptual framework

Informed by the reviewed literature, this thesis investigates the following main hypothesized relationships. These are conceptualised as illustrated in the overall conceptual framework for this thesis, presented in Figure 3.1.

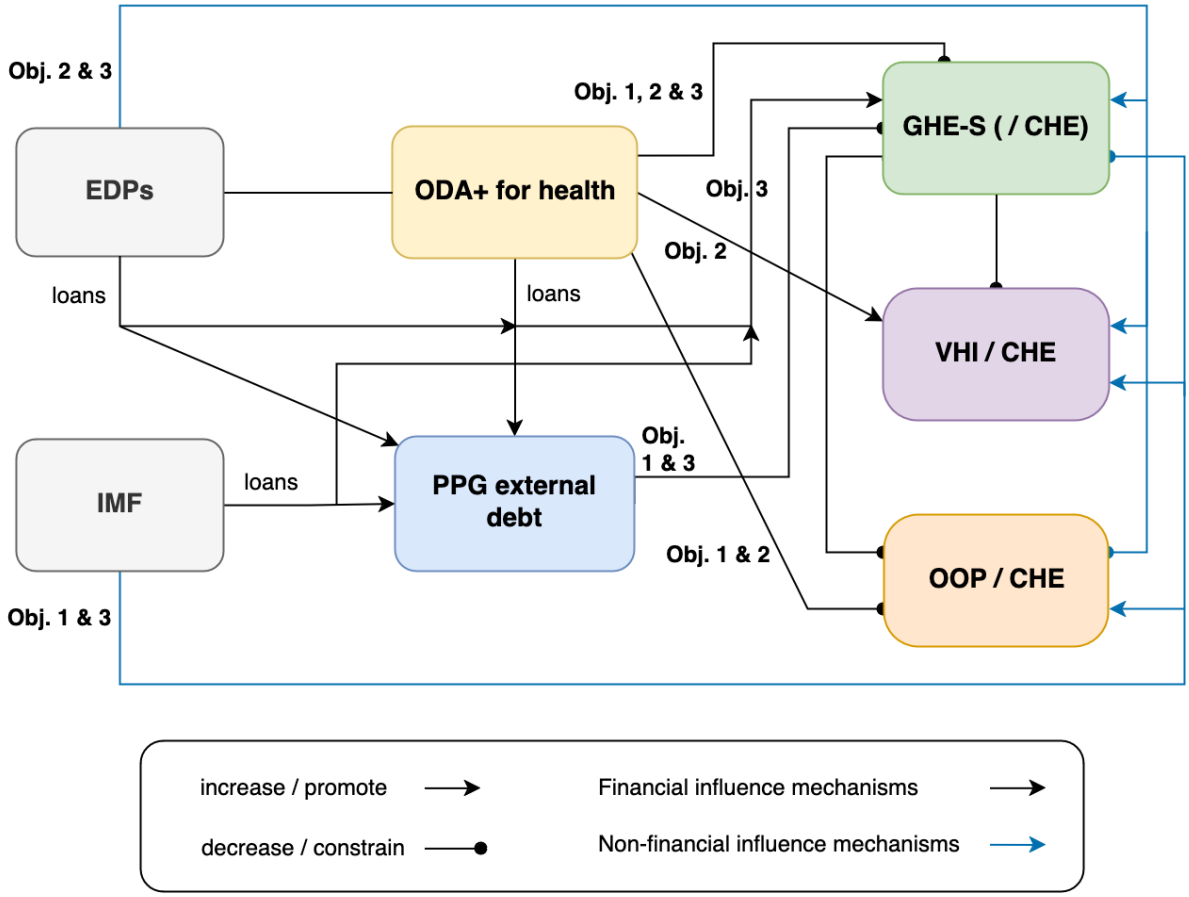

Figure 3.1: Main hypothesized relationships in thesis. The objective numbers show which objectives cover each relationship. Objective 1 is explored in Chapter 6, objective 2 in Chapter 7, and objective 3 in Chapter 8.

ODA⁺ for health from EDPs can either be fully additional and not displace the government's own health spending from domestic revenue, or it can lead the recipient government to lower its health spending, which is referred to as fungibility. Alternatively, ODA⁺ for health could lead to synergy or co-financing, i.e. that the recipient government provides additional funds to the health sector as a result of receiving ODA⁺ for health. EDPs can disburse their funds to the central government as budget support or earmark them to the health sector. Both of these can affect domestic government expenditure allocations to the health sector. These relationships are explored mainly in Chapter 6 at the global level and Chapter 7 at the country level. Following the literature presented in the present chapter, this thesis focuses on exploring mainly a fungibility hypothesis whereby domestic government funds for the health sector are displaced by external health funds.

In relative terms, one could hypothesize the following principal relationships between ODA+ for health, OOP and Voluntary Health Insurance (VHI) as shares of Current Health Expenditure (CHE) (referred to as "*reliance on*" OOP and VHI). CHE is a term from the WHO SHA that refers to total consumption of health goods and services by the residents of a country (136, 137). It includes both internal and external financing sources, and does not include capital spending.

- A: *ODA+ for health could decrease reliance on OOP and VHI*. This could occur through supporting the health system via governmental and non-governmental channels leading to a lower reliance on OOP and VHI (covering costs / external subsidy) (71).
- B: *ODA+ for health could increase reliance on OOP and VHI*. This could occur indirectly via ODA+ for health displacing GHE-S; ODA⁺ for health directly leading to increased supply of NGO/private-run facilities with some level of co-payment and thereby increased reliance on OOP; and/or funding pilots and scale-up of CBHI, increasing VHI/CHE (71).

The main hypothesis used is that the displacement effect of ODA⁺ for health on GHE-S is the main (indirect) mechanism of effect, increasing reliance on OOP and VHI. Secondarily, the hypothesis is applied that ODA+ for health directly promotes CBHI and thereby VHI in contexts where CBHI receives EDP funding (e.g. (35, 36, 39, 40)), and that ODA+ for health mostly works to cover/subsidise user fees, more than the contrary. The latter hypothesis is used on the background of a diverging literature (60, 67-71). The fungibility mechanism would then lead to a synergistic influence promoting VHI and a mutually counteracting influence on reliance on OOP, as illustrated in Figure 3.1.
These relationships are explored at the global level in Chapter 6 and at the country level in Chapter 7.

Borrowing external funds is a commonly used government strategy to increase fiscal space in the short term (138). This space could be used to increase social spending in the short term and funds could be invested to increase the revenue base for future health spending in the longer term. This could lead to a positive association with government health spending. However, the resulting outward resource flow from borrower countries to creditors as loans and its interests are repaid could constrain fiscal space for health and thereby GHE-S in the longer term and lead to an increased reliance on OOP over time (e.g. (e.g. (78, 80, 81). The Public and Publicly Guaranteed (PPG) external debt stock might also constrain health

spending in the present due to the prospect of future loan repayments. These relationships are explored in Chapters 6 and 8.

Alongside financial transactions are the non-financial influence mechanisms of EDPs+IMF. For EDPs, technical assistance for health financing policy reform working toward UHC appears to be a relatively common phenomenon, while other influence mechanisms are less explored. It is hypothesized that the different non-financial influence mechanisms, that this thesis aims to unpack, follow the general mandates of EDPs to promote equity, UHC and the SDGs, which is conceptualised as relative decreases in OOP and relative increases in financing sources that are pooled including VHI and GHE-S.

Specifically pertaining to loans, these also come with loan conditionalities, and in the case of the IMF, which countries turn to when experiencing balance of payments problems and other kinds of macroeconomic instability (139, 140), these are provided under programs with a macroeconomic framework and accompanying policy recommendations. These policy recommendations and conditionalities generally pertain to the macroeconomic and fiscal level, with the aim of achieving a sustainable balance of payments, macroeconomic stability, economic growth and ensuring that countries are able to repay loans from the IMF and other international creditors (139-141). This has historically involved measures of fiscal austerity, including wage ceilings, trade and private sector liberalization, privatization of state bodies and public health assets (95, 96, 99, 100, 110, 140). In the short term, this might constrain the fiscal space for health leading to lowered GHE-S (95, 96, 99, 100). Loan conditionalities may also require stimulation of the private health service market (95, 99, 100), and combined with privatization measures, this could shift the payment pattern in the health system more toward OOP and VHI. Longer term, positive growth and revenue effects from IMF policy influence could kick in and work to expand the fiscal space for health again. Following the bulk of the independent academic literature, the general hypothesis was however applied that the different non-financial influence mechanisms of the IMF have the effect of decreasing GHE-S, including per CHE, and increasing VHI and OOP / CHE. The WB is a special case in its position as an EDP and at the same time being the sister institution of the IMF. The hypothesis was applied that by having a development mandate, their direction of influence would align more with the UHC-promoting positions of EDPs, however the critical literature warranted a more agnostic approach to exploring their influence in Senegal that could potentially also prove to push the health system toward being characterized more by a predominant private health sector with a higher degree of reliance on OOP and VHI and less GHE-S. These relationships are explored in Chapter 6 at the global level (IMF conditionalities) and Chapter 8 at the country level.

The different presented financial relationships are further motivated and substantiated in the methods chapter (Chapter 4).

As for the presumed relationship between GHE-S on one side and VHI and OOP on the other, these form the bulk of domestically sourced components of CHE in LMICs (137) and were thus presumed to be inversely correlated if measured in relative terms as proportions of CHE, *ceteris paribus* (142).

3.9. Further delineation of research topic

The intricate relationships between EDP+IMF activities and public revenue generation or Domestic Resource Mobilisation (DRM) was not empirically explored, as this constitutes its own separate and complicated area of research. In the same line, no empirical investigations were performed of the relationships between public revenue generation or DRM and GHE-S or social spending, as this again is another extensive, separate body of research, and instead the research rests on the general assumption that more DRM will generally tend to increase the fiscal space for health, provided the health sector is prioritised by the government.

While both are essential, this research focuses on who contributes and not who benefits from health financing, meaning it does not investigate the third health financing function of purchasing health services, or health financing allocations (143). This choice was made for two main reasons: A: To focus the scope of the research; B: Due to the presence of complete, standardised health financing source data for LMICs in the WHO GHED, including for Senegal (137). Correspondingly, matters pertaining to Results-Based Financing and Performance-Based Financing are not included in this thesis, which are provider payment mechanisms and relate to service purchasing. Some considerations of pooling of funds are made in Chapter 7, as this emerged from the findings from Senegal in the case of CBHI, warranting discussion.

The case study of Senegal (Chapter 8) looks at both IMF and WB conditionalities. However the econometric study (Chapter 6) only looks at IMF conditionalities, because these have been formally collected and standardised in a quantitative dataset by IMF Monitor (140), which is not the case for WB conditionalities. The literature review in Section 3.6 on the quantitative relationships between IMF conditionalities and health financing thus reflect these data limitations, and the methods used in Chapter 6 are delineated accordingly.

This thesis focuses on the two largest and most powerful IFIs in terms of their central position in determining domestic policy at the fiscal level (IMF and WB) and the health sector level

(WB) (100, 110, 144). This focus comes at the expense of an in-depth interrogation of the content of policy conditionalities from other IFIs that as a general consideration have historically enjoyed less privileged positions, such as the African Development Bank, Islamic Development Bank and others, but also some bilateral EDPs that may have proven influential e.g. in Senegal. This choice was made to delineate the topic where the strongest influence was expected, but it may come at the cost of a more in-depth understanding of the influence from other IFIs and some bilateral creditors. This is further discussed in the thesis limitations section (Chapter 9).

Having reviewed the main literature underlying this thesis and introduced the main hypotheses to be explored as informed by the literature, Chapter 4 describes the methods used for doing so.

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4. Chapter 4: Methods

This chapter describes the methods used in this thesis. It begins with a description of the overall study approach, explains the study design for the multi-country panel data analysis and the country case study in Senegal, and ends with discussions of the ethical considerations and epistemological position of the research. Methodological limitations are discussed in Chapter 9 – Discussion.

4.1. Study approach

This research employs a mixed-methods approach using panel data regression analysis, descriptive statistical analysis, interviews and document review. Mixed methods can be used to gain both a factual, descriptive understanding of a research question, including by cross-checking information, while also reaching a deeper and more comprehensive understanding of the research question. This can occur through exploring concepts that are not easily quantifiable and eliciting potential explanations for observations made, which improves the interpretability of findings and expands the scope for generation of hypotheses and theories (7, 8). A mixed methods approach was deemed necessary to be able to unpack and understand the complex interplay between External Development Partners (EDPs) + International Monetary Fund (IMF), their funding flows and associated non-financial influence pathways, global and local macroeconomic circumstances, and national health financing sources and associated government policy. The results chapters progress from the global to the country level and begin by exploring the "what" of the research questions, seeking to establish directions and sizes of effect at the global level. The following chapters then unpack the "how", by performing an in-depth exploration of mechanisms of effect as identified in Senegal.

4.2. Global panel data study

The global-level panel data study attempted to answer the research question of whether and how official development assistance, public external debt repayments and IMF loan conditionalities affect the degree of reliance on domestic government health financing vs. OOP in recipient/borrower countries. For this study, secondary observational data from a number of databases were compiled as outlined below.

4.2.1. Variables

4.2.1.1. Dependent variables

Dependent variables were Government Health Expenditure as a Source (GHE-S)/Current Health Expenditure (CHE), Out Of Pocket payments (OOP)/CHE, GHE-S/Gross Domestic

Product (GDP), and OOP/GDP. GHE-S and OOP were chosen as these two sources jointly make up nearly 80% of health financing in Low- and Middle-Income Countries (LMICs) (10), with contrasting levels of (/absent) progressivity, financial risk protection, prepayment, pooling, and cross-subsidy, with associated consequences for health service access for the poor and in turn health outcomes, as explained in Chapter 2 (11-18). Interpretations are thereby clearer than for Voluntary Health Insurance (VHI), which makes up only 5% of LMIC health financing and may cover a range of different financing schemes for different population groups in different countries, challenging interpretation at the cross-country level (see Chapter 9: Discussion for further details) (10).

The degree of progressivity of health financing can be measured in financing incidence analysis using the Kakwani index (11, 20) (e.g. (21, 22)), however cross-country time-series data of health financing progressivity are not available. Instead, GHE-S/CHE and OOP/CHE were used, based on the general rationale that when household OOP becomes a more predominant source of health financing and GHE-S less so, the burden of payment is shifted from taxpayer, who contributes in accordance with their ability to pay, onto the patient at the point of care, irrespective of their ability to pay. At a crude macro-level, the degree of health financing progressivity should resultingly worsen. These two variables measure each health financing source relative to total current health financing. They respond to absolute increases and decreases in OOP and GHES, as well as changes in the other sources constituting the denominator of CHE. They also have a mutual accounting relationship, whereby GHE-S + OOP + Voluntary Health care Payment Schemes (VHPS) + Social Health Insurance (SHI) + External Health Financing (EXT) ≈ CHE, which means that changes in the proportion of one health financing source relative to CHE will by definition lead to changes in the proportions of the others relative to CHE, all things equal. The dependent variables GHE-S/GDP and OOP/GDP were therefore added. By dividing by GDP, the introduction of spurious correlations from dividing dependent and independent financial variables with the same deflator numbers was avoided, which would have been necessary to adjust for inflation, if financial variables were measured as absolute amounts or per capita (25). It also meant that a population covariate could be omitted (necessary in the case of measuring variables directly), increasing parsimoniousness and degrees of freedom and reducing the risks of multicollinearity, instrument proliferation and overidentification. Measuring directly would also make some economic interpretations less meaningful (e.g. *"entering into an IMF programme resulted in X$ higher/lower OOP expenditure"*, or X% if log-transformed).

Changes in GHE-S/GDP have been commonly analysed in the literature (e.g. (29-32)), however no other literature was identified that examined dynamics of OOP/GDP as a

dependent variable, but OOP was divided by GDP as for GHE-S for consistency. Doing so accounts for the fact that larger economies have overall higher levels of health spending, both public and private, and changes in these variables are thus reflective of a relative expansion or contraction of the given health financing source compared to overall growth rates in the economy. Growth and inflation rates are thus accounted for, and increases in GHE-S/GDP should, if spent effectively, translate into a real expansion of health services, beyond what would be expected if the government was raising a fixed proportion of GDP as revenue and allocating a fixed proportion of General Government Expenditure (GGE) to health. This implies increased fiscal space for health and/or increased political priority of the health sector. Increases in GHE-S/CHE on the other hand can occur merely as a result of decreases in any other health source. Technically, this should improve overall financing progressivity, however it is necessary to consider and interpret changes in GHE-S/CHE along with changes in the other 3 dependent variables. Increases in OOP/GDP reflects a relative expansion of direct payments to the health system beyond what would be expected as a result of economic growth and inflation. This implies a relative expansion of private health sector services and/or public health services funded by user fees. Increases in OOP/CHE mean that user fees are on aggregate expanding more than other sources, or as before, that other sources are decreasing relative to OOP. A joint interpretation of all four variables is thus necessary and should together provide an impression of the overall effects of independent variables on the balance between the two main health financing sources in LMICs, public vs. private health financing, and ensuing degree of overall health financing progressivity.

The data source for GHE-S and OOP was the World Health Organisation (WHO) Global Health Expenditure Database (GHED) (10), while GDP data were obtained from the World Bank (WB) databank (33).

4.2.1.2. Independent variables

4.2.1.2.1. Official development assistance variables

Four variables were used to measure the influence of Official Development Assistance$^+$ (ODA$^+$) on the outcomes of interest: Disbursements on ODA$^+$ for health / GDP and ODA$^+$ for non-health purposes / GDP, both disaggregated by channel of assistance via government or civil/private sector. Debt relief, administrative expenses and other in-donor country expenses were removed to count only real transfers to the recipient country. Based on the literature (29-31, 34-45), as per Chapter 2, the main hypothesis was established that increases in $\frac{ODA^+ \; for \; health}{GDP}$ would be associated with decreases in GHE-S/GDP and decreases in GHE-S/CHE as well, partly because EXT (≈ ODA$^+$ for health) is part of CHE. Following several authors (29-31, 39, 40, 42), it was further hypothesized that this would depend on funds being channeled “on-budget”, i.e. via the government. The mirror-hypothesis for non-health ODA$^+$

was that fungibility between sectors could occur when disbursements were channeled via the government, leading to an increase in GHE-S/GDP, and potentially in GHE-S/CHE. The hypothesis for GHE-S/GDP relies on positive intersectoral fungibility effects benefiting the health sector being larger than positive economic growth effects.

OOP/CHE could correspondingly be positively associated with $\frac{ODA^{+}\ for\ health}{GDP}$, and negatively associated with $\frac{ODA^{+}\ for\ non-health}{GDP}$, both mediated via effects on GHE-S/CHE. Two possible effects act counter to the main hypothesized positive relationship between $\frac{ODA^{+}\ for\ health}{GDP}$ and OOP/CHE: A direct replacement effect from EDPs covering health service fees for users would decrease OOP/CHE, and the accounting relationship between EXT and OOP both being parts of CHE would also drive a negative association.

Data on ODA⁺ disbursements were obtained from the Organisation for Economic Cooperation and Development (OECD) Creditor Reporting System (CRS) database (46).

4.2.1.2.2. Public external debt variables

Public and Publicly Guaranteed (PPG) external debt service / GDP, and PPG external debt stock / GDP were used as the main debt variables. The inclusion of these two variables follows the hypothesis of a constraining effect of the public external debt burden on fiscal space for health and hence on GHE-S, as indicated by most of the available studies on the topic (31, 43, 47-51). Both the servicing flows and the stock of debt were included following Lora and Olivera (2006) (47), and because the stock of debt / GDP could serve an adjustment purpose: Adjusted for the size of the debt relative to GDP, are increases in debt servicing / GDP associated with decreases in GHE-S/GDP and GHE-S/CHE? This was done as paying off large chunks of a small debt could reflect healthy fiscal conditions and ample external currency reserves, allowing a government to get rid of some of its relatively small external debt. Conversely, small repayments on a large external debt could indicate a struggling government where debt is amassing but repayments do not follow.

Studies on debt and OOP were scarce and inconsistent (31, 52). A positive relationship between $\frac{\text{PPG external debt service}}{\text{GDP}}$ and OOP/CHE was hypothesized, mediated via the hypothesized decreases in GHE-S/GDP and GHE-S/CHE from debt servicing.

Data for the debt variables were obtained from the WB International Debt Statistics database (53).

4.2.1.2.3. IMF variables

IMF programmes and their conditionalities are key factors determining fiscal conditions in IMF programme participant countries, which could have implications for all sectors including the

health sector. A variable counting the number of IMF conditions in a country-year was therefore included, along with an IMF programme participation dummy, taking the value of 1 when there were conditions in place in a country-year and 0 when not. The main hypothesis was that having more IMF conditionalities could lead to fiscal austerity, spending cuts, privatisation, wage ceilings etc., leading to lower government health spending and a higher reliance on OOP. Additionally, being in an IMF programme could by itself have some of these effects via policy advice, technical advice, transfers of knowledge, beliefs, ideology or other exchanges that exist around conditionalities themselves (2, 54-65).

The research from IMF/WB staff runs counter to this general hypothesis. Their findings would support a hypothesis stating that IMF programmes and their conditionalities support countries struggling economically to reduce their fiscal deficit, generate revenue, improve budget management and execution, and social sectors could be insulated from any spending cuts via e.g. spending floors, which could lead to more government spending on health and less reliance on OOP (66-70).

Data for IMF conditionalities came from the IMF Monitor conditionality dataset[15] (72).

4.2.1.3. Covariates

A number of covariates were included to control for other factors that could influence the dependent variables.

GDP per capita was included as this could co-determine the outcome variables (e.g. government health spending (2, 4, 29, 73, 74)), independent variables of interest (e.g. aid (75)), and other covariates (e.g. Infant Mortality Rate (IMR) (76)) (33). Adjusting for GDP (/ capita) is standard practice across the literature examined exploring the same/similar outcome variables (examples: (2, 30, 37, 43, 50, 77)). These data were obtained from the WB Databank (33).

IMR was included as a proxy for unmet population health need (78-80). Increases in IMR could be codetermined by decreases in GHE-S, and conversely, increases in IMR could drive both GHE-S and OOP. IMR has been found to be a stronger determinant of ODA for health than the Under-5 Mortality Rate (U5MR) and HIV prevalence (79). IMR was preferred to alternative health need variables for this reason, and because e.g. HIV prevalence was deemed to be a

[15] The IMF's own MONA database (71) has been heavily criticized for an ad hoc manner of data collection, the presence of duplicates, a break in reporting in 2002, certain key pieces of information on conditions missing, and underreporting and misclassification of conditions being ubiquitous (2), so it was therefore decided to use the IMF monitor database instead.

stronger driver of ODA for health in the (early/mid) Millenium Development Goal era, and it is much more epidemiologically concentrated than IMR, potentially serving as a de-facto proxy for Southern Africa, rather than a more general health need predictor. The dependency ratio has the issue that in Upper-Middle Income Countries (UMICs) it may predominantly proxy the health needs of the elderly, whereas in Low Income Countries (LICs) it may almost exclusively proxy the health needs of children, with resulting challenges for modelling and interpretation. IMR data were obtained from the United Nations Inter-Agency Group for Child Mortality Estimation (81).

Two variables respectively measuring government effectiveness and control of corruption were included from the Worldwide Governance Indicators database (82). These are survey-based and capture perspectives from respondents on different dimensions of respectively government effectiveness and corruption, which are aggregated into single indicators, and measured as standard deviations on a normal distribution (82). More corrupt governments have been found to spend less on health (83, 84), and the same has been found for less effective governments (10, 82). The variables are frequently used in the development assistance literature as they are found to codetermine both flows and effectiveness of development assistance (e.g. (85-93)). Some have found evidence of development assistance being completely offset by decreases in domestic revenue among the most corrupt countries (94). Counter to intuition, more corrupt governments have however been found to implement aid to the health sector more effectively, leading to better health service coverage (95). This finding was explained as follows: "*They seek to please donors with progress in the health sector, to justify additional flows and continue their rent-seeking behavior in more lucrative sectors*" (95). Additionally, country governance may jointly determine and be determined by IMF programme participation, and which recommendations they provide to a country (96).

An armed conflict covariate was included, as armed conflict has been linked to lower government health spending (34). Conflict might also lead to more OOP/CHE due to destabilisation of government functions in terms of revenue generation, planning, fiscal management and budget execution for health, along with competing military expenditures, and health insurance schemes might also destabilise. Effects on OOP/GDP are more difficult to predict as both might drop but at different speeds, or OOP might increase depending on particular circumstances in the given conflict, although user fees require functional health services to pay for. Conflict has by some been found to determine development assistance and lending flows (97, 98), and by others not (99). The Uppsala Conflict Data Program / Peace Research Institute Oslo Battle-Related Deaths Dataset was used for this variable (100). It was

measured as a dummy variable taking the value of 0 if the number of battle-related deaths in a country-year was less than 1 per 1 million population and 1 if equal to or higher.

Lastly three dummy variables were included to measure colonial legacy from either UK, France or Spain using the Issue Correlates Of War dataset (101). Country health systems, financing policies and mechanisms, as well as other systems and institutions, are partly shaped by their colonial legacy and the continued policy influence from the formerly colonizing bilateral donors (102-105). This could co-determine the dependent variables by shaping the payment patterns seen in the health sector, as different former colonizers could have different ideas and preferences for how health care should be financed in their former colonies, perhaps to some extent reflecting the systems and schemes present in their own countries. Bilateral donors are also known to give more development assistance to their former colonies (e.g. (95, 106-108)).

4.2.2. Variable transformations and data sample

4.2.2.1. Variable transformations

The following variables were natural log-transformed due to right skew: GHE-S/GDP, OOP/GDP, $\frac{ODA^{+}\ for\ health}{GDP}$ and $\frac{ODA^{+}\ for\ non-health}{GDP}$ (separated by government and civil/private sector channel), $\frac{\text{PPG external debt service}}{\text{GDP}}$, $\frac{\text{PPG external debt stock}}{\text{GDP}}$, and GDP/capita. This was also done to facilitate the interpretation of relationships as elasticities, and it is commonly applied in the econometric health financing literature (e.g. (31, 37, 45, 48)).

As motivated in Section 4.2.1, all dependent and independent financial variables were measured per GDP similar to other authors (e.g. (29, 30, 47, 78)) (except of course GDP/capita).

Values of all current US$-financial variables in the models including alternative models in sensitivity tests were deflated into constant 2020 US$ using annual average Consumer Price Index (CPI) data (33).

4.2.2.2. Data sample

Data availability allowed us to examine the time period 2005-2019 for a final panel of 105 LMICs (see Appendix 4 for full list). Countries with more than five years of missing data for the main dependent and independent variables of interest or GDP were excluded. This threshold corresponds to 33% of the data for a given time series, which means that a linear regression for a such country would be based only on ten time units, possibly disjointed by significant gaps, with resulting reservations regarding the quality and validity of a such regression.

Countries excluded in this process were mainly relatively small countries with likely limited ability to gather and report national statistics (examples: Kiribati, Saint Lucia, Dominica), and countries severely affected by conflict with large gaps in data reporting (examples: Syria, Libya, Afghanistan). Gaps in one key data series might also reflect more general issues with national statistical capacity, and the process of exclusion may therefore have reduced the degree of measurement error in the final dataset (see Chapter 9: limitations).

4.2.3. Choice of estimator and diagnostic testing

The final dataset was an unbalanced panel of *n = 105 and t = 15*. For this panel shape, the Generalized Method of Moments (GMM) estimator is most appropriate and comes with several advantages over alternative estimators (19, 26, 109-112). After its invention, GMM was broadly applied across the econometric literature (109). It has the advantage of enabling statistical inference when the probability distribution of the data is not known (109), which is typically the case in socioeconomic panel data sets. It does not rely on prior distributional assumptions, and under certain regularity conditions it provides consistent, efficient and asymptotically normal estimates (23). Specifically, the system GMM estimator was used, a subtype of GMM estimators. System GMM has been specifically designed for panel analysis with a small number of time periods and a large number of units of observation (19). It builds a system, or a matrix, of equations that include both the direct levels of variables included, and first-differenced equations, which greatly improves efficiency (19). It also allows for a large set of lagged instruments, or moment conditions, to be generated, after which they can be "collapsed" (19). This removes redundant 0-values and leaves a set of instruments that help describe the relationship between explanatory and outcome variables in a manner that is more independent from the influence of the error term (i.e. it helps address the endogeneity problem) (113). Endogeneity was expected in most of the variables through measurement error (see Chapter 9: limitations) and simultaneity. For example ODA might affect government health spending but countries with lower government health spending might receive more ODA, increases in IMR might drive increases in public and private health spending to address increasing health needs, or IMR might increase as a result of lower health spending as previously mentioned, etc. System GMM also allows one to keep factors in the levels equation that may apply across multiple countries and have fixed effects over time such as the colonial legacy variables (and alternative variables in sensitivity testing), as opposed to difference GMM where these are cancelled out (19, 114). Specifically, two-step system GMM was used, as it is a more efficient estimator than regular GMM (19, 112).

In comparison, using other common panel data estimators can be problematic: The Ordinary Least Squares (OLS) estimator is the Best Linear Unbiased Estimator (BLUE) only when all

Gauss-Markov assumptions are met. These can rarely be met for panel data that may suffer from endogeneity, heteroskedasticity and autocorrelation, and the probability distribution of the data may not be known, as mentioned previously. The latter also rules out the use of other Maximum Likelihood Estimation (MLE) methods. The Two-Staged Least Squares (2SLS) estimator, an Instrumental Variable (IV)-estimator, would be feasible, but it mainly performs well for balanced datasets[16] under homoskedasticity (19). GMM models the error structure comparatively more accurately in the presence of heteroskedasticity and serial correlation and does not have the same issues with unbalanced data (19).

One problem with the GMM method is that it produces downward-biased standard errors (19, 115). This problem can, however, be corrected with the Windmeijer-correction, which was applied (115). Following the literature, the Hausman test (116) was used to examine whether a random- or fixed-effects model was more appropriate for describing the data (examples: (37, 43, 50, 77, 117)), which fell in strong favour of a fixed-effects approach such as GMM ($p=0.0000$ for all models). The Arellano-Bond test was used to test for first-order serial correlation in levels (19, 110, 118, 119). The Hansen test (26) was used to examine the validity of instruments while avoiding instrument proliferation and overidentification (118, 120, 121) (Box 1).

[16] 2SLS drops those observations where lagged observations are missing, thus magnifying gaps in the dataset, which system GMM does not (19).

Box 1: The issue of instrument proliferation in GMM

The main advantage of the system GMM estimator is also its weakness, namely the introduction of time-lagged variables into models to address endogeneity (6). As the number of instruments increases, the explanatory power of each independent variable is diluted while the R^2 of the model goes toward 1.0, the precision of estimates declines and the model becomes unusable for prediction (6). This is referred to as "overfitting" the model (6, 19). Another problem with instrument proliferation is excessive "overidentification", i.e. if one's model contains so many moment conditions that it makes it impossible to estimate whether one's instruments are exogenous (i.e. they do not correlate with the error term) and hence valid (19, 23). The original Sargan- (24) and Hansen tests (26) for overidentification have been shown to be invalid in the face of instrument proliferation (6, 27, 28) – which naturally tend to coincide. An immediate sign of instrument proliferation is a Sargan/Hansen test p-value of the implausibly high number of 1.000 (6, 19). The issue of instrument proliferation necessitates limitation of the number of instruments used.

The null hypothesis of the Hansen test is that the generated instruments (or overidentifying restrictions) are exogenous, i.e. they do not correlate with the error term, and are thereby jointy valid (6). There is no hard and fast rule about the exact values of the Hansen-test that can be considered "safe", but a value between 0.05 and 0.1 is generally not considered enough to convincingly accept the null (118, 120, 121). The different recommended limits in the theoretical literature were examined as well as those used in the empirical literature, and the value of 0.15 was adopted as a lower safety threshold, but this decision has an unavoidable element of arbitrarity. When instrument proliferation becomes an issue is also not clear, and different recommendations and empirical applications were similarly examined, arriving at p=0.6 as an upper limit, as well as the rule of thumb that instruments must not outnumber units of observation (19, 120).

Recommendations by Roodman (2009) were further followed, and the difference-in-Hansen test was applied for the subset of GMM instruments generated in the levels equation, which also has the null-hypothesis that these are exogenous, i.e. valid (6, 19). For both this and the Arellano-Bond test, a lower cut-off of p=0.15 was again applied as a safety threshold for consistency.

In order to be able to achieve acceptable diagnostic test statistics, the instrument matrix was collapsed, and the number of instruments generated was curtailed by applying lag-limits (6, 42, 118, 119). The robustness of the findings to lag-limits was then scrutinised by adjusting these in sensitivity analysis.

Before deciding on a final method of estimation, the Wooldridge test was applied to check for serial correlation in the dependent variables, which was present as expected (122, 123). A Breusch-Pagan test for heteroskedasticity was performed, which was present in two models (124). These test results supported GMM as the best available estimator. The models were also checked for the presence of multicollinearity, and reduced-form models were generated to address this, which is further explained in Chapter 6.

Heckman selection models were generated to check for selection bias into IMF programmes as described in Box 2 (1, 9, 66). This was relevant for full models where IMF variables were still included. A number of unit root tests for dependent variables were performed as detailed in Chapter 6 and its Appendix 4. These consistently rejected the null-hypotheses that panels contained unit roots.

Following the motivations and hypotheses for each variable, all independent variables except for colonial legacy and year-dummies were treated as endogenous, while colonial legacy and year-dummies were treated as exogenous (19, 118, 119).

Microsoft Excel was used to compile the data (125), Stata was used to analyse the data (126), the command “Xtabond2” was used to perform GMM (19) and the command “Asdoc” to export regression results (127).

Box 2: Heckman selection models and IMF programme participation

Entering into an IMF programme happens for a reason - countries generally approach the IMF under conditions of economic turmoil/instability (1-5). These underlying conditions might in turn affect the dependent variables, leading to selection bias, or in other words: unobserved variables that make IMF programme participation more likely could be associated with the dependent variables. To check for this, one has to construct a Heckman selection model (9). This requires first building a Probit regression model of factors that might help explain why a given binary state occurs, in this case IMF programme participation. This was built following the available literature on factors that may help determine IMF programme participation (1-5), which included the current account balance, reserves, exchange rate, growth rates and a proxy for democracy. The Heckman selection model then captures the calculated hazard for participation in an IMF programme as the Inverse Mills Ratio, which can then be added to one’s main model to adjust for selection bias, if present (1-5, 9). In the case of this study however, the Inverse Mills Ratio was consistently insignificant in all models and led to substantial loss of degrees of freedom, and was therefore not included, but it was explored whether including it would change the results in sensitivity analysis.

4.2.4. Lag structure and model selection

The effects studied might occur with a time delay, warranting the investigation of different model lag structures. To decide on a lag structure and select a final model, advice on GMM model selection was adapted mainly from Kiviet (118), Kripfganz (119) and Roodman (19) to the specific data. In summary, 0–2-year lags were first jointly examined for all independent variables of interest, and lag-years were then sequentially reduced until arriving at a parsimonious specification that maximised t-statistics for each variable while achieving acceptable diagnostic test-statistics. This turned out to generally and considerably favour 1-year lags for nearly all financial independent variables of interest in all models, which were therefore adopted universally rather than “cherry-picking” alternative lag structures for a few variables, as an attempt at lowering the degree of confirmation bias in the model selection process. 1-year lags are commonly used in the reviewed literature, as some of the fiscal and macroeconomic dynamics investigated often may have a delayed effect that manifests in the following (budget) year (e.g. (2, 47)). An important exception from this were IMF-variables: Some authors treat IMF-variables as lagged (2, 5, 73) while others do not (3), arguing for both contemporaneous and delayed effects. The results in Chapter 6 tended to show higher, at times significant or borderline significant t-statistics when unlagged, so these results were followed and IMF-variables were kept unlagged. This was deemed economically reasonable since when a program starts and conditions apply and these were thereby counted in the dataset, they apply to the current budget year and may affect government spending in the present, as well as having further delayed implications, which however were insignificant in all models. Alternative lag structures (0-2 years) were tested for all variables, including IMF-variables, in sensitivity analysis.

When deciding on the number of GMM-style lag limits, the model with the lowest number of instruments, the lowest Hansen test p-value and otherwise acceptable diagnostic tests that showed significant results for independent variables of interest, was generally selected (6, 19, 119). This was done to avoid type II error in the first instance while minimising the risk of overfitting and overidentifying models. The robustness of significant results was then interrogated in sensitivity analysis, where lag limits were manipulated.

The full models included a number of variables and tested multiple hypotheses at once. Reduced form models were generated to increase parsimoniousness, reduce the risk of type II error due to multicollinearity, and conversely lower the risk of significant findings being due to multiple comparisons. Inspired by Kiviet (2020) (118), independent variables of interest with a p-value above 0.2 were sequentially removed, starting with the variable with the highest p-value (or lowest t-value) first. All covariates were still kept in these models and then

changed/removed in the respective sensitivity analyses. This yielded parsimonious models that isolated significant relationships while still adjusting for covariates.

4.2.5. Model specification

The full model specification was:

$$
\begin{aligned}
Y'_{it} = \; & \beta_0 + \beta'_1 Y'_{i,t-1} + \beta'_2 ln\left(\frac{ODA^{+} for\ health}{GDP}\right)'_{i,t-1} + \beta'_3 ln\left(\frac{ODA^{+} for\ non\text{-}health}{GDP}\right)'_{i,t-1} \\
& + \beta_4 ln\left(\frac{debt\ service}{GDP}\right)_{i,t-1} + \beta_5 ln\left(\frac{debt\ stock}{GDP}\right)_{i,t-1} \\
& + \beta_6 IMF\ conditionalities_{it} + \beta_7 IMF\ participation_{it} + \beta_8 ln\left(\frac{GHES}{GDP}\right)_{it} \\
& + \beta_9 ln\left(\frac{GDP}{cap}\right)_{it} + \beta_{10} IMR_{it} + \beta_{11} gov.\ effectiveness_{it} \\
& + \beta_{12} corruption\ control_{it} + \beta_{13} conflict_{it} + \beta'_{14} independence\ from'_{it} + \mu_i \\
& + \nu_t + \varepsilon_{it}
\end{aligned}
$$

Details of each individual variable measurement and transformation is available in Chapter 6. The terms μ_i is country-specific, time-invariant effects (country fixed effects), ν_t is time-invariant cross-country effects (year fixed effects, such as shocks), and ε_{it} is the error term. Country fixed effects are automatically included in the levels equation in System GMM and eliminated from the difference equation (19, 114), while year dummies capturing year fixed effects were manually added in all models, as is recommended in the theoretical literature (19, 118, 119) and common practice (e.g. (40, 128)).

4.2.6. Sensitivity analysis

The sensitivity analysis is described in Chapter 6 and Appendix 4. Econometric data compilation and model building involves a great degree of choice, as discussed in the limitations section of Chapter 9. Alternative choices might have produced different results. Showing the implications of these different choices is therefore essential to ensure a model is robust and begin to be able to make claims about, and for readers to be able to critically assess, the validity of one's findings. The following sensitivity analyses were therefore performed as robustness checks:

- Models with no lags and with 2-year lags for independent variables of interest.
- Alternative lag-limits.
- Per capita financial variables instead of per GDP.
- U5MR and MMR instead of IMR (81, 129).
- Alternative conditionality variable (72).

- Alternative deflator.
- Alternatives to colonial legacy dummies:
    - No colonial legacy dummies
    - Regional dummy for Sub-Saharan Africa (SSA) instead, to adjust for the range of different dynamics specific to this region that may not apply elsewhere (also used as interaction term).
    - Lower-Middle income Country (LMC) and LIC World Bank income group dummies instead (meaning that UMIC was then the baseline state), to investigate the different relationships differentiated by country income group without splitting the dataset into problematically small groups for GMM estimation, with resulting narrowing of the scope for causal inference (also used as interaction terms).
    - No log-transformation of relevant variables, as this is essentially a data manipulation, although it was well justified due to substantial right skew of many variables and to facilitate economic interpretation of relationships as elasticities.
    - Aggregate ODA-variables as just health and non-health purposes, which lowered the ability to identify fungibility but increased parsimoniousness.
    - Full models with Inverse Mills Ratios, to adjust for any degree of selection bias in IMF programme participation, even decidedly insignificant, which came at the expense of 13 countries and 214 observations.
- Interaction terms: These were multiplied onto the main independent variables of interest to look for signs of effect modification from the following set of variables:
    - Government effectiveness, as debt, aid and IMF programmes might affect health financing differently depending on the level of government effectiveness (see Section 4.2.1.2).
    - Corruption, for the same reasons (see Section 4.2.1.2).
    - GHE-S/GDP multiplied on $\frac{\text{PPG external debt service}}{\text{GDP}}$, to test the hypothesis that debt servicing could have differential impact on the health system payment pattern at different levels of GHE-S.

4.3. In-depth case study in Senegal

4.3.1. Study setting

4.3.1.1. Motivation for Senegal as a case country

The case country was selected based on the following criteria:

- Being relatively peaceful and politically stable within the most recent decades, to describe the relationships between EDPs+IMF and the government in a time of stability rather than extraordinary circumstance. This criteria was set to optimise the opportunity for obtaining findings that might be generalizable to other contexts.
- Being a SSA country, as many countries in this region rely heavily on OOP (10), the region has the highest unmet health needs globally, the highest levels of poverty, the most resource constrained public sectors, it receives relatively high amounts of development assistance and International Financial Institution (IFI) loans, and many countries in the region were and still are experiencing a strongly increasing debt burden (33).
- It should preferably be less corrupt than the SSA average, anticipating that interview responses from ministries, agencies and other organisations would be more credible and less likely to be motivated by personal gain or to hide a truth. This criteria was also set to improve the expected reliability of numbers and official reports and policy documents, to not be misled in the research and increase the chances of observations made being due to legitimate EDP/IMF-government interactions and financial flows and not due to corruption.
- The country should have an IMF and WB office and existing programs in place from these institutions.
- It should have country offices from some of the world's major bilateral and multilateral donors in the health sector, as measured by global ODA disbursements for health. This was to optimise the scope for learning lessons that might be informative to major donors and all countries they work in.
- It should have received a reasonable amount of ODA per capita and ODA^{+} for health per capita, roughly in the range of the SSA average or above, to be able to identify an influence of financing flows, associated non-financial develop cooperation, and fungibility dynamics.
- It should be relatively externally indebted, as compared to the regional average for SSA (Table 4.1), to optimise chances of identifying an impact of the external debt on health financing.
- It should have a relatively high reliance on OOP, to investigate the hypothesis of external determinants of this reliance as per the research questions.

Table 4.1 displays selected statistics that aided the choice of Senegal as a case country. The statistics displayed in Table 4.1 of course differ somewhat from the numbers used to choose the case country in 2018, however the most recent numbers are provided here to give an up-to-date overview. Notably, Senegal changed status from LIC to LMC in 2019 (130).

As seen, Senegal fit the selection criteria well. Until recently, it had been relatively politically stable and less corrupt than the SSA average (further discussed in Chapters 7 and 9). It is more externally indebted than the averages for SSA, LICs and LMCs (33). It receives ODA and ODA$^+$ for health at a comparable level to the SSA average. It has a stronger reliance on OOP than the SSA average. It has IMF and WB country offices, as well as country offices from major international development partners including the United States, France, Canada, UNICEF, WHO and more.

	Senegal	**SSA**	**LIC**	**LMC**
GDP (billion US$, 2022) (33)	28	44	11	151
GDP per capita (US$, 2022) (33)	1,599	1,700	750	2,562
PPG external debt stock, (billion US$, 2022) (33)	15	481	121	1,194
PPG external debt service (billion US$, 2022) (33)	1	45	6	109
PPG external debt stock per GDP (%, 2022) (33)	52	23	23	15
PPG external debt service per GDP (%, 2022) (33)	4	2	1	1
ODA per capita (US$, 2022) (33)	46	49	66	27
ODA$^+$ for health per capita (US$, 2022) (46)	18	14	13	4
GHE-S per CHE (%, 2021) (10)	26	33	24	42
OOP per CHE (%, 2021) (10)	47	33	38	35
VHI per CHE (%, 2021) (10)	6	6	7	4
EXT per CHE (%, 2021) (10)	18	25	32	18
GHE-S per GGE (%, 2021) (10)	4	7	6	9
GHE-S per GDP (%, 2021) (10)	1	2	1	3
GHE-S per capita (US$, 2021) (10)	18	52	10	75
Transparency International corruption perceptions index (2023, higher score ~ less corrupt) (131, 132)	43 / 100	33 / 100	-	-

Table 4.1: Selected statistics for Senegal as compared to averages in Sub-Saharan Africa (SSA, excluding high-income countries), Low-Income Countries (LICs), and Lower-Middle income Countries (LMCs). All US$ are 2022 current US$. GDP: Gross Domestic Product. PPG: Public and Publicly Guaranteed. ODA: Official Development Assistance. GHE-S: Government Health Expenditure as Source. CHE: Current Health Expenditure. GGE: General Government Expenditure. GDP: Gross Domestic Product.

4.3.1.2. Case country overview

Senegal is a West African country with approximately 18 million inhabitants (2023) (133). Compared to the rest of the African continent, Senegal has enjoyed relative political stability as a constitutional multiparty democracy with generally peaceful transitions of power, albeit at certain times partly achieved via the arrest of demonstrators and imprisonment of political opponents, and with significant recent political instability around the 2024 presidential election (134-138). Senegal became independent from France in 1960. It had a GDP per capita of around $1,599 (33). Over the last 20 years, ODA has fluctuated around approximately $100 per capita per year (constant 2021 US$), which is about 1.5-2 times the SSA average (46). ODA for health purposes in Senegal has risen from about $7 in 2007 to about $18 in 2022 (OECD CRS data, constant 2021 US$), which is at a comparable level to the rest of SSA (46). The largest bilateral development partners in the health sector in Senegal in 2022 as measured by ODA disbursements (grants + loans) were the United States and Japan, who transferred respectively US$49 million and $42 million, followed by France (US$ 24 million), Korea ($20 million) and Canada ($19 million) (46). The largest multilateral partners in the health sector were the WB International Development Association (IDA) branch ($73 million), the Global Fund to Fight Aids, Tuberculosis and Malaria (GFATM) ($30 million), the Bill and Melinda Gates Foundation (BMGF) ($17 million) and Gavi ($9 million) (46).

Following the Heavily Indebted Poor Countries (HIPC) initiative and the Multilateral Debt Relief Initiative (MDRI), where Senegal received $2.836 billion (2015 US$) in debt relief (139), Senegal spent less of its government revenue on external debt servicing (Figure 4.1) (33, 140). This trend however reversed in 2007 at 4% to grow to 32% in 2020 (Figure 4.1).

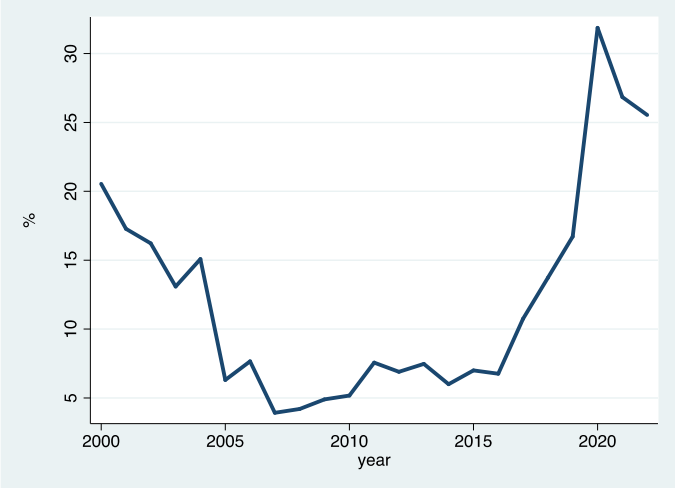

Figure 4.1: Public and Publicly Guaranteed (PPG) external debt servicing per government revenue in Senegal from 2000-2022 [4, 16].

Chapter 8 provides an in-depth description of the composition and evolution of PPG external debt in Senegal. Appendix 2 provides an overview of key health indicators in Senegal.
The case study interviews were conducted in the wealthier, predominantly urban region of Dakar and the poorer, predominantly rural region of Tambacounda, to obtain a diversity in perspective from different interviewees (see Section 4.3.2.1). Figure 4.2 shows a regional map of Senegal.

Figure 4.2: Regional map of Senegal. (From: Wikimedia Commons, URL: https://commons.wikimedia.org/wiki/File:Senegal,_administrative_divisions_-_en_-_monochrome.svg. License: https://creativecommons.org/licenses/by-sa/3.0/deed.en. Image unedited.)

Table 4.2 shows selected socioeconomic and health system indicators illustrating great inequality between the regions of Dakar and Tambacounda, with strong health system infrastructure and human resource concentration in the Dakar region (141-143).

Indicator	Dakar	Tambacounda
Population (million, 2023)	3.9	1.0
Poverty rate (%, 2018/19)	9	62
Hospitals (2020)	14	1
Health centres (2020)	25	7
Nurses (2020)	1168	75
Midwives (2020)	550	121
Doctors (2020)	651	12

Table 4.2: Selected socioeconomic and health system indicators for the Senegalese regions of Dakar and Tambacounda (141-143).

4.3.1.3. Health financing sources in Senegal

The largest source of health sector financing in Senegal is OOP, followed by GHE-S, EXT, voluntary prepayments and SHI (Figure 4.3) (10). OOP has increased over time while GHE-S has been relatively stagnant. Adjusted for inflation, GHE-S in absolute terms was similar in

2019 (272 million constant 2021 US$) compared to 2006 ($258 million) (10). Apart from a significant increase in GHE-S in response to the Covid-19 pandemic in 2020, GHE-S as a percent of GGE has decreased steadily from 9% in 2000 to 4% in 2021, and from 1.8% of GDP in 2006 to 1.1% in 2021 (10). Compared to the rest of SSA, Senegal's per capita GHE-S is relatively low at $18 per capita vs. a $62 per capita average across SSA, while OOP is at a similar level ($34 per capita in Senegal vs. $33 per capita across SSA) (2021 data) (10). OOP health expenditures per capita have remained substantially higher than GHE-S since about 2009, reaching $34 in 2021 vs $18 from the government (10). External health financing has grown to $13 per capita, increasingly comparable to the level of health financing from the government, while SHI contributions from employers and employees, and voluntary prepayments have remained relatively small by comparison since about 2013 (10).

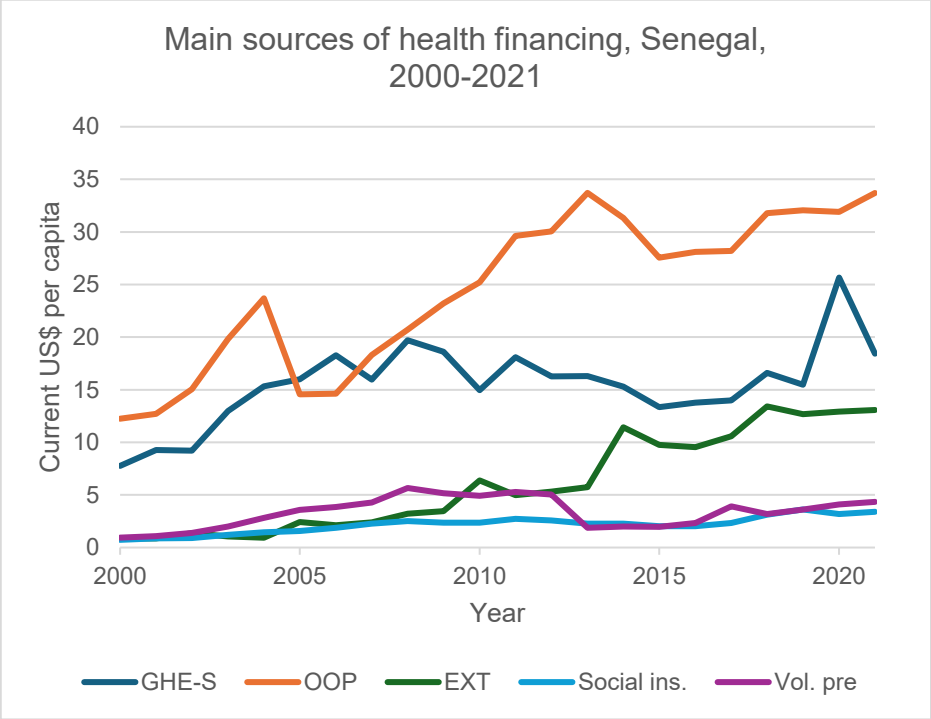

Figure 4.3: Main sources of health financing in Senegal, 2000-2021 (10). GHE-S: Government Health Expenditure as a Source. OOP: Out-Of-Pocket payments. EXT: External health financing. Social ins: Social health insurance. Vol. pre: Voluntary prepayments.

Using national poverty surveys conducted in 2005 and 2011, Sow et al. (2013) investigated the changes in levels of household spending on health (OOP) and capacity to pay in Senegal (144). The authors found that the proportion of OOP as a share of households' capacity to pay had increased substantially, especially for the poorest quintile where this share increased from approx. 5.0% to 11.9% compared to 3.3% to 4.2% in the wealthiest quintile. An estimated 2.59% of households in the survey incurred catastrophic health expenditures in 2011, and 1.78% were pushed into poverty as a result of these expenditures.

4.3.2. Qualitative Methods

4.3.2.1. Interview participants

Interviewees were sampled based on an initial stakeholder mapping across bilateral and multilateral development partner institutions, ministries and agencies in the central government, institutions at the regional and district level in Tambacounda, health system management staff, civil society organisations and academia. Development partner and government representatives were selected due to their central placement in the nexus of influence relevant to the research questions. The inclusion of civil society organisations, academics and health system managerial staff served as a critical counterbalance to the accounts obtained from these larger, official, political institutions interviewed. Participants in Tambacounda were included to obtain accounts far from the political and economic centre of Dakar, based on the notion that the reality and lived experiences in a poorer, in-land region at the intermediary and primary health system level might differ from those obtained at the central level.

38 candidate interviewees were identified, of which 32 responded and participated in the study (Table 4.3). Candidate participants from two multilateral organisations, two hospitals, and two academics were unavailable for interview or did not respond.

Interviews were conducted primarily in-person in Dakar and in the Tambacounda region of Senegal, while two were conducted remotely over Skype. Table 4.3 shows the distribution of interview participants across stakeholder groups and geographical regions.

Stakeholder group	**Number of participants**		
	Total	*Dakar*	*Tambacounda*
Bilateral development partners	**4**	*4*	*0*
Multilateral development partners	**4**	*4*	*0*
Central government*	**9**	*9*	*0*
Regional/District government	**3**	*0*	*3*
Hospital management	**4**	*1*	*3*
Civil Society Organisations	**5**	*4*	*1*
Academics	**3**	*3*	*0*
Total interviews	**32**	*25*	*7*

*Table 4.3: Interview participants. *Central government participants came from four different ministries, however the specific ministries are intentionally not mentioned to protect the anonymity of participants.*

4.3.2.2. Interview data collection

Semi-structured interviews were conducted with study participants. These have a loose structure with open-ended questions that allow for further exploration of the topic discussed (145). This interview method was chosen to enable an in-depth exploration of the research topic. The general questionnaire structure was maintained between stakeholder groups, but individual questions were tailored to focus on areas of respondent knowledge and expertise. Participant information sheets and consent forms were provided in French or English depending on the preferred language of the participant. Interviews were conducted in the preferred language of the participant. A professional interpreter was used where necessary (18 out of 32 interviews). Interview recordings were transcribed by a transcriptionist. Handwritten notes were taken from all interviews.

Interview questions centered around domestic health sector financing and the different schemes and policies; stakeholder priorities and opinions regarding the different contribution sources in Senegal and the balance between public and private financing; EDP+IMF influence on the public health budget; development assistance fungibility including in the health sector; development lending including to the health sector; external debt effects on the health budget; IMF/WB programs and conditionalities and their influence on the health sector and its financing; and perceived impacts of the above on health service access for the poor. Questions regarding external debt effects on the health budget were omitted from interviews in Tambacounda to match the expected knowledge and expertise of interviewees in this region.

4.3.2.3. Interview data analysis

Interviews were analysed using the Framework method (146). The Framework method enables a systematic establishment of general themes and patterns inductively from interview data that may illustrate principal phenomena, whilst also allowing for the deductive application of themes established a priori based on the research questions and existing literature and frameworks (147-149). Thematic analysis also moves beyond e.g. mere quantification of certain words or phrases, which can be performed using the alternative content analysis (149), and instead attempts to qualitatively describe ideas and patterns in interviews. The interview data analysis process was both inductive and deductive: Before analysis, a set of themes were established informed by the theory underlying the research and the different key questions asked. An initial round of coding of 1/3 of interviews (n=11) was then performed, adding themes to the thematic framework as they emerged from the data. When no more themes emerged, the resulting set of themes was revised, themes with a high degree of overlap were merged while less clear concepts were clarified and better delineated. The final

coding framework was validated by an independent researcher who applied it to one sample interview. This led to the addition of one sub-theme. The final coding framework is available in Appendix 5.

NVivo 12 was used to code interviews (150). The final coding framework was applied to all transcripts, and summaries of participant statements on each theme were put into a framework matrix in Microsoft Excel (125). Central and illustrative quotations were also added to the framework matrix. After having coded all transcripts, the coding framework was reassessed for any revisions/merging of categories needed (similar to Ward et al. 2013 (151)). No changes were deemed necessary. An example interview data framework matrix is shown in Table 4.4, illustrating its layout. The actual framework matrix can be made available in anonymised form upon request for bona fide research or academic review purposes only, to protect participant confidentiality.

	Participant #1	Participant #2	…
Theme 1	Summary	Summary Quote	…
Theme 2	Summary	Summary	…
…	…	…	…

Table 4.4: Example interview data framework matrix.

During and after the completion of the matrix, patterns emerging mainly horizontally (between interviews and stakeholder groups) were then described in the results sections of Chapter 7 and 8, as relevant to each separate study question, supported by direct quotes illustrating observations made.

4.3.2.4. Document review data collection

A purposive document review was also conducted. Documents were identified from EDP+IMF and government websites relating to health financing, health financing policy, as well as policy/strategy papers and lending agreements from the IMF and WB in Senegal. This included the Senegalese National Statistics and Demography Agency (ANSD) (152), the Universal Health Coverage Agency ("*Agence de la Couverture Maladie Universelle (CMU)*" (153), The Ministry of Health and Social Action (154), The Ministry of the Economy, Planning and Cooperation (155), the Ministry of Finance and Budgeting (156, 157), the major bilateral and multilateral donors present in Senegal at the time (USA, France, Canada, Japan, Belgium, Luxembourg, Spain, the GFATM, BMGF and Gavi (46)), the IMF (158, 159) and WB (134). Google Scholar, PubMed, Embase, Cochrane, CINAHL, Scopus, Web of Science and EconLit were also searched for relevant academic literature, using keywords such as Senegal, health financing, equity, debt, loan conditionalities, etc. Full details of the search strategy are

provided in Chapters 7 and 8. No time period constraint was applied to the search. A total of 329 full-text documents were retrieved and reviewed.

4.3.2.5. Document data extraction and analysis

For Chapter 7, documentation of EDP activities deemed to have direct implications for the mix of domestic health financing sources in Senegal was included and integrated into the results section, including facts that confirmed or rebutted interview statements (triangulation). For Chapter 8, information regarding Senegal's external borrowing and main economic policy discussions, recommendations and conditionalities from the IMF and the WB was summarised in written and table form. This included all available key policy documents from the IMF and WB and all WB project loan agreements for the health sector in Senegal since 1966. Policy recommendations and conditionalities directly relating to the levels of and balance between domestic health financing sources and health financing scheme coverage were included in the results section. These findings were also triangulated against interview statements and quantitative data.

4.3.3. Quantitative methods

To investigate patterns relevant to the research questions and triangulate and contextualise qualitative findings, descriptive quantitative analysis of the health financing composition in Senegal since 2000 was performed using the WHO GHED as the main source of national health accounts data (10). These data are supplied to the database by the Senegalese government according to WHO standards. GHE-S, EXT, OOP and Voluntary Health Insurance (VHI) (*Mutuelles*)) were examined. For Chapter 8, levels and trends of PPG loan disbursements separated by creditor type, and PPG external debt stock and debt service were examined using WB data (33). Total official development loans received by sector from the OECD CRS database were also included to examine official creditor priority of the health sector in Senegal (46). We focused on the period after 2000, as this was the period when WHO GHED data became available.

Through the analysis of the results for EDP+IMF influence on domestic health financing sources, analytical frameworks for understanding this influence emerged, which are presented in Chapter 7 and 8 (the analytical framework in Chapter 7 was developed as a synthesis and modification of existing frameworks combined with the empirical findings, while the framework in Chapter 8 was also informed by the available literature and economic theory).

4.3.4. Ethical considerations

The key ethical considerations for this research revolved around participant confidentiality and ensuring interview data integrity for the case study in Senegal. The remaining data were

publicly available secondary data, and ethical considerations for these parts of the research were therefore limited to general research ethics considerations as stipulated in relevant LSHTM academic regulations and research practice policy documents (160-162).

4.3.4.1. Interview participant confidentiality

Interview participants were able to choose their preferred level of anonymity, as shown in the ethical consent form in Appendix 5. This ranged from no anonymity over some degree of anonymity e.g. name and organisation, to complete anonymity. However, upon writing up Chapter 7 and 8, I realised that the most appropriate solution to ensure that I protected the confidentiality of interviewees was to simply anonymise all of them completely. This was mainly due to the fact, that the group of government officials, EDP officials, academics and Civil Society Organisation (CSO) representatives working specifically within health financing in Dakar is not very large, and people could still potentially be identified from statements made if the name of their organisation or government agency, or even agency policy, projects or financial transactions made, were mentioned. For this reason, all interviews were treated as fully anonymous when the related chapters were written up, only referring to which general participant group the interviewee belonged to (development partner, government, CSO etc.). This change was submitted as an amendment to the LSHTM Research Governance and Integrity Office and approved as a non-substantial change.

4.3.4.2. Data management

Interviews were recorded using a digital voice recorder, and stored on an encrypted, password protected USB-drive. Handwritten notes were taken from all interviews, written up on a computer, and stored on the protected USB-drive. Interview recordings were shared with a professional transcriptionist, who was bound by a London School of Hygiene & Tropical Medicine (LSHTM) Standard Mutual Confidentiality Agreement. Recordings and their transcripts were shared between me and the transcriptionist as encrypted, password-protected files. After completing the transcripts, the transcriptionist deleted all files from her computer as per our agreement. All used secondary datasets and documents were used in accordance with their license agreements and cited appropriately. The interview codebook, participant information sheet, and example interview topic guide were uploaded to the LSHTM data repository (163) and are available in Appendix 5.

4.3.4.3. Ethical approvals

Ethical approvals were obtained from the London School of Hygiene Observational / Interventions Research Ethics Committee (*ref: 16420*) and the National Health Research Ethics Committee in Senegal (*protocol SEN19/56, ref: 00172*).

4.4. Epistemology and ontology

By going from a global-level quantitative study to an in-depth mixed methods case study, the research conducted in this thesis can be seen as subscribing to the *pragmatist* worldview (164, 165). In this worldview, emphasis is placed first and foremost on the research problem, and different methods are then used to approach this problem, acknowledging the strengths and limitations of each (164, 165).

Within this approach, the quantitative methods applied in this thesis generally originate from a *postpositivist* tradition (164). Positivism was characterized by a firm belief in an absolute truth waiting to be discovered by the use of the scientific method, and the postpositivists rejected this belief when studying the behaviour and actions of humans, acknowledging biases in the research process (164-166). Both rely heavily on quantitative methods, and seek to reduce human and social complexity to numbers, from which relationships or even knowledge of cause and effect can be derived (164-166). The global-level econometric study in Chapter 6 can be seen as mostly leaning toward this worldview in its quantitative, critical hypothesis testing. It however acknowledges its limitations for drawing causal inferences from observational data covering complex social, political and economic relations.

The qualitative methods applied originate from a *constructivist* tradition that seeks to understand the world through the study of the subjective meanings of different individuals (164, 165). In this tradition, these meanings are thought to be constructed partly via interaction with others (social constructivism), and the constructivist researcher concerns themself with these meanings, interactions and the historical, social, political and cultural context that shape them (164, 166). However, as this thesis concerns itself with what is believed to be real economic phenomena, its qualitative components rather belong to an ontologically *realist* worldview, believing that there is an external reality that exists independently of people's beliefs or understandings about it (165). It then uses interviews and document review, among quantitative tools, to help understand this reality, without applying a belief that reality was co-constructed in interviews with participants.

By applying a *pragmatist* approach, this thesis leverages the research tools developed in these different epistemological traditions to explore its research questions at different levels and from multiple angles, reaching discussion points and interpretations that could not have been reached using only one of these methods.

Having described the methods used and epistemological position of this research, the following chapter presents an analytical commentary building the case for the importance of the research on debt and health financing presented in Chapter 6 and 8.

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First Name(s)	Frederik		
Surname/Family Name	Federspiel		
Thesis Title	External Development Partner and International Monetary Fund Influence on Domestic Health Financing Sources in Low- and Middle-Income Countries: Panel Data Analysis and Case Study in Senegal		
Primary Supervisor	Josephine Borghi		

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5. Chapter 5: Growing Debt Burden in Low- and Middle-Income Countries During Covid-19 May Constrain Health Financing

Authors: Frederik Federspiel, Josephine Borghi, Melisa Martinez-Alvarez
Published in: Global Health Action, 22 June 2022[17]

Chapter overview:

The analytical commentary presented in this chapter further builds the case for the research presented in Chapters 6 and 8, by illustrating how the public external debt repayments of LMICs have outgrown government health expenditures in many borrower countries. A brief research agenda is proposed for empirically exploring how this growing debt burden could impact countries' ability to expand domestic government health spending before making some preliminary policy recommendations.

Of note, this chapter is not a main empirical piece in itself, but rather a short commentary and analysis performed during the course of the research, to bring attention to the possible implications of the growing debt burdens of LMICs, communicate a research agenda for better understanding these and provide early policy recommendations arising from the analysis. Minor changes have been made from the published version for consistency across chapters.

[17] Evidence of retention of copyright is provided in Appendix 3

5.1. Abstract

Debt burdens are growing steadily in Low- and Middle-Income Countries (LMICs), compounded by the Covid-19 economic recession, threatening to crowd out essential health spending. In 2019, 54 LMICs spent more on servicing their debt to foreign creditors than on financing their health services. While development loans may have positive effects on population health, the ensuing debt servicing requirements may have detrimental effects on health through constrained fiscal space for government health spending. However, the existing evidence is inadequate for a general understanding of whether, how and under what circumstances, debt may constrain government health spending. We call for more research on the impacts of debt on health financing and call on creditors and borrowers to carefully consider the potential impacts of lending on borrower countries' ability to finance their health services.

5.2. Introduction

Low- and Middle-Income Country (LMIC) governments have become increasingly indebted over the past decade (Figure 5.1) (1). Concurrently, debt repayment levels have grown steadily, channelling funds out of LMIC government budgets to public and private creditors in High-Income Countries (HICs) (Figure 5.2) (1). The number of LMICs that spend more on debt servicing than health has increased substantially from 33 in 2010 to 54 in 2019 (Figure 5.3 and Figure 5.4) (1, 2). In 2019, four countries, Angola, Benin, Cameroon and the Republic of the Congo, spent at least five times more on external debt servicing than they spent on health. Reductions in the public budget due to debt servicing will likely have implications for sectoral budget allocations, including health. Government health spending is essential for the functioning of all publicly funded health services from prevention to cure. The deeper the levels of poverty in a population, the less people can afford or have access to private health services, and government health financing is crucial to achieve Universal Health Coverage (UHC), serving all of the population, reducing health inequalities, and protecting people from financial risk when using health services (3, 4). The growing debt burden in LMICs seen in Figures 1-3 therefore gives cause for concern of constrained fiscal space for health and the implications hereof. Indeed, based on observational data similar to that presented in Figures 2-4, the Jubilee Debt Campaign have brought attention to the countries spending more on debt than health in the beginning of the pandemic and called for debt service cancellation for the year 2020 (5).

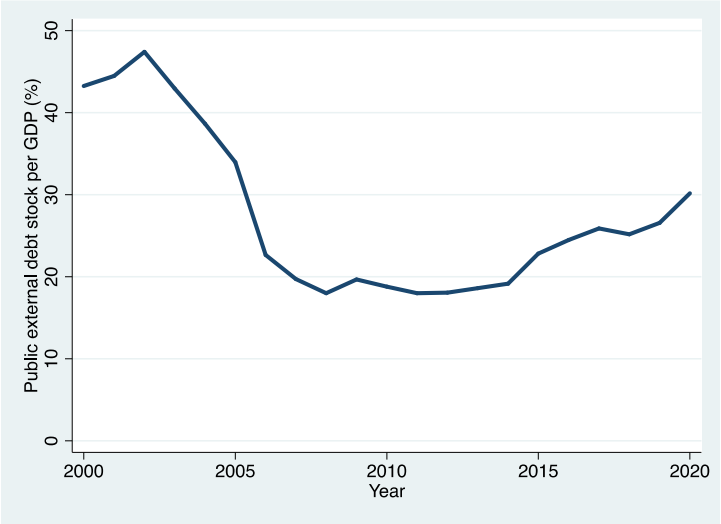

Figure 5.1: Public external debt stock as a proportion of Gross Domestic Product (GDP) in Low- and Middle-Income Countries (LMICs) from 2000-2020.

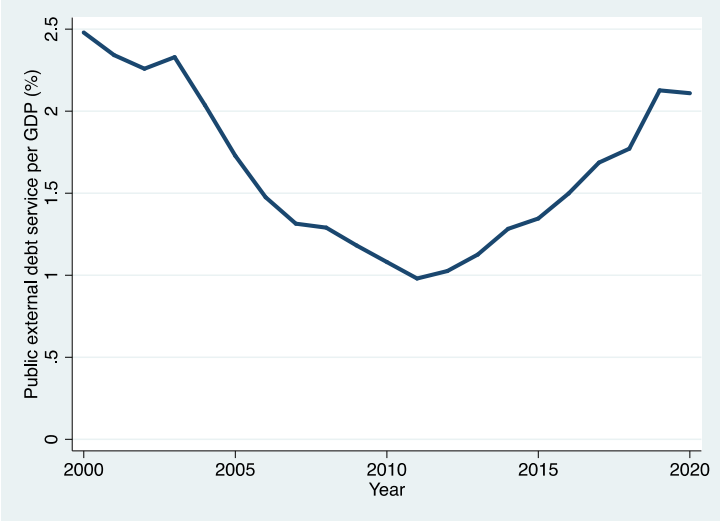

Figure 5.2: Public external debt service as a proportion of Gross Domestic Product (GDP) in Low- and Middle-Income Countries (LMICs) from 2000-2020.

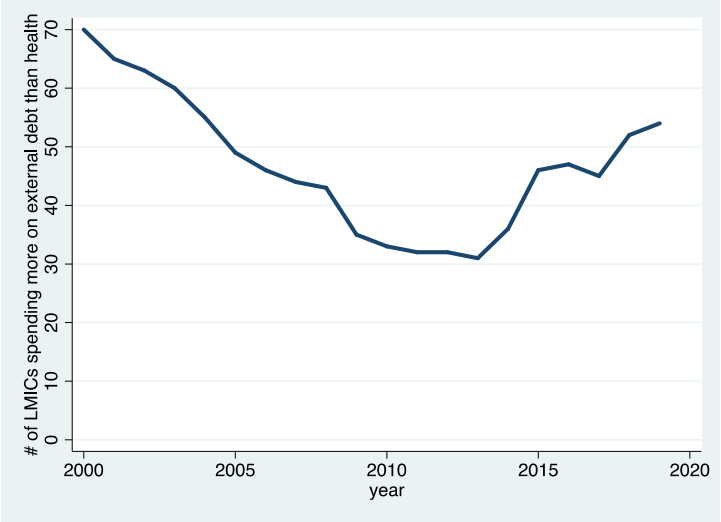

Figure 5.3: Number of Low- and Middle-Income Countries (LMICs) that spent more on public external debt servicing than health, 2000-2019.

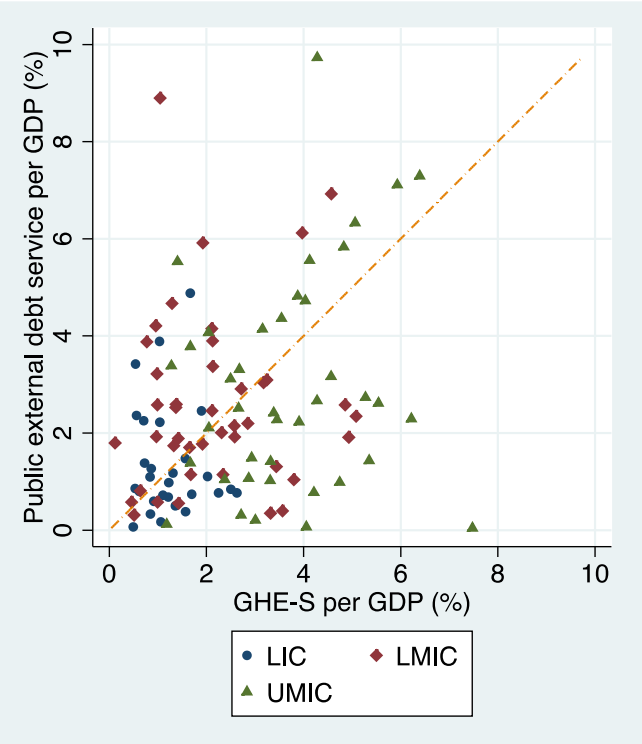

Figure 5.4: Public external debt service and government health expenditure from domestic revenue (GHE-S) as fractions of Gross Domestic Product (GDP) (%) among Low-and Middle-Income Countries (LMICs) in 2019. The diagonal line indicates equal spending on debt servicing and health. Countries above the line spend more on external debt than on health and vice versa.

5.3. Covid-19 has led to more development lending which may increase debt levels

Covid-19 has triggered the largest economic recession since World War II (6). This has eroded the tax base in many LMICs, contracting government revenue and leaving a rift between countries expected to recover economically and others experiencing lasting damage to government revenue (6). Early WHO estimates from countries with available national health accounts data for 2020 - mainly HICs - indicate public health spending increases, which may reflect increased funds to help manage the pandemic (7). This may however not be the case for LMICs operating under severe public resource constraints, and where government revenue does not show signs of recovery after the initial shock (6). In such settings, Covid-19 may take up already scarce health resources for its prevention and management, and studies are ongoing to assess the impacts of emergency expenditure reallocation to manage Covid-19 on the rest of the health budget in Pakistan and South Africa (8). Covid-19 also adds to the health burden through worsened mental (9) and maternal health (10), amongst others, increasing the need for health financing.

In addition to these impacts, Covid-19 also appears to have affected the levels of development assistance committed by donors and the balance between loans and grants. Total aid

commitments made in 2020 increased by 19% in real terms compared to 2019 (11). This increase was made up almost entirely by development loan commitments, presumably to help countries cope with the impacts of the pandemic, while grant commitments stayed at approximately the same level (11). While increased donor commitments is positive, it will be important to monitor first of all disbursement rates of these commitments over the following years, but also if a new normal will be established, where development loans are a more prominent mode of providing development assistance, which will in turn further increase debt levels.

5.4. What do we know about the relationship between debt and health expenditure?

Our empirical understanding of the full impacts of development lending, the ensuing debt stock and its servicing on health financing in borrower countries is, however, limited and conflicting. Three studies of countries in Africa (using data from 1975-1994) (12), Latin America (1985-2003) (13) and South and Southeast Asia (1980-2010) (14) have found a higher debt burden to be associated with less government health spending or less overall social spending, while a larger study of 120 LMICs found the opposite (1995-2010) (15). Other research has identified constraining effects on government health spending of IMF loan conditionalities (e.g. (16, 17)). The identified empirical studies (12-17) are all quantitative multi-country studies. We therefore have a limited understanding of which particular social, economic and political country characteristics and which lending arrangements constrain health spending or support it. Neither do we fully understand whether or how debt servicing affects equity by impacting the distribution of health financing in a given country and resultingly health service access for different population groups. Such in-depth analysis may be necessary to be able to provide relevant policy recommendations to creditors and borrowers.

Another important consideration is that the debt of LMICs originates from various sources, with much coming from concessional Official Development Assistance (ODA) loans. These may have gone to the health sector in the first place, such as for constructing health centres, and may thus have a beneficial effect on population health. The proportion of ODA loan disbursements going to health is however rather small, at less than 4% of all ODA loans to LMICs in 2019 (11). Development lending to other sectors such as the productive, economic and infrastructure sectors may also have effects on health, which may be beneficial, for example through improved food security or improved financial or geographical access to health services, or harmful, for example through pollution or increased availability of health-harmful commodities. Additionally, development lending to these sectors may lead to

economic growth which, if taxed and partly allocated to the health sector, may expand government health spending. These considerations and the data presented in Figures 1-4 give rise to several questions: Does more public external debt servicing lead to less government health spending, and vice versa? Do the positive effects of development lending on health financing outweigh the negative effects, if any, of debt repayments? What are the effects of development loans and the associated debt burden on equity in health financing in borrower countries?

In the 2000s, a steady decline in debt repayments occurred after the Heavily Indebted Poor Countries (HIPC) initiative and the Multilateral Debt Relief Initiative (MDRI) were launched in 1996 and 2005 respectively, offering debt relief to 39 heavily indebted LMICs (18, 19). While some researchers have discussed the potential of these initiatives to free up funds for health financing (20, 21), to the authors' knowledge, no statistical testing of the actual health financing impacts of this natural policy experiment have been performed, and neither have dedicated case-country policy analyses. Nor are we aware of any analyses of the real health financing impacts of the recent G20 Debt Service Suspension Initiative, temporarily delaying debt servicing requirements for 2020 and 2021 for participating countries (22). As such it is not known whether and under what circumstances the assumption of decreased debt servicing freeing up fiscal space actually translates into more health spending.

5.5. Recommendations

Figure 5.1 and Figure 5.2 show concerning trends in the debt obligations of LMICs, while Figure 5.3 and Figure 5.4 illustrate the level of debt servicing relative to health expenditure in LMICs. While Covid-19 has shown the world the necessity and importance of health spending, it has also eroded government revenue in many countries and has elicited an increase in development lending. These events prompt us to call for more empirical, peer-reviewed research analysing the following questions:

First, does increased external debt servicing result in lower government health spending? If so, under what circumstances? Conversely, does increased fiscal space generated from decreased debt servicing lead to increased health spending? If so, under what circumstances?
Second, do development loans to health and other sectors have a net positive effect on health financing in the long run, when debt repayments are taken into account? What are some individual country experiences in regard to this question?
Third, what are the implications of development loans and ensuing external debt for equity in health financing in borrower countries?

We believe a range of different methodological approaches from the social and public health sciences, both quantitative and qualitative, will be necessary to address these questions. The answers may vary greatly between countries, and in-depth case country studies may be necessary to address these questions in sufficient detail and understand individual country realities.

We ask for creditors to be keenly aware of the illustrated growth in external debt obligations of borrower countries, and to carefully consider the potential short- and long-term impacts of lending on the ability of these countries to finance their health services. The growing debt burdens in LMICs may mean that debt relief will at some point again have to be considered to ensure continued sustainable development in borrower countries. Debt-to-health swaps, where funds freed up from debt relief are earmarked for health purposes, are one way to ensure that debt relief translates into increased health spending (alongside debt-to-education swaps, debt-to-environment swaps, etc.) (23).

For borrower countries, we ask policy makers to prioritize social sectors and safeguard these from budget cuts when debt repayments have to be made. We ask them to carefully consider the short- and long-term social and environmental implications of taking up a development loan, and to exercise strong vigilance about the type of creditor and lending arrangements engaged in, to avoid a disproportional burden of repayment being passed on to the next generation, with ensuing possible implications for the fiscal space for social spending.

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Student ID Number	lsh1601722	**Title**	Dr.
First Name(s)	Frederik		
Surname/Family Name	Federspiel		
Thesis Title	External Development Partner and International Monetary Fund Influence on Domestic Health Financing Sources in Low- and Middle-Income Countries: Panel Data Analysis and Case Study in Senegal		
Primary Supervisor	Josephine Borghi		

If the Research Paper has previously been published please complete Section B, if not please move to Section C.

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Stage of publication	**Not yet submitted**

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For multi-authored work, give full details of your role in the research included in the paper and in the preparation of the paper. (Attach a further sheet if necessary)	I designed this study as Principal Investigator (PI) in collaboration with my supervisors. I produced the study protocol and research ethics applications with input from supervisors. I assembled the data, performed the analysis, interpreted the results, and wrote the first draft paper, with the input necessary along the way from my supervisors. My supervisors and I then critically revised the article, with me being responsible for performing the revisions necessary.

SECTION E

Student Signature	[redacted]
Date	20/9-2024

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Date	23/09/24

6. Chapter 6: Development Assistance, Public External Debt, IMF conditionalities and Domestic Health Financing in Low- and Middle-Income Countries

6.1. Chapter overview:

This chapter presents the first piece of empirical research conducted for this thesis. It uses regression analysis on multi-country panel data looking for quantitative evidence at the global level for some of the main relationships explored in this thesis. It explores whether aid, debt and IMF conditionalities have discernible effects on GHE-S and OOP on aggregate across countries, seeking to establish the "*what*" at the global level for this research, looking at directions and sizes of effect. By operating at the global level, it sacrifices local knowledge, detail and local applicability, but gains in its ability to test the principal economic hypotheses posed in this thesis. These relationships and accompanying non-financial relationships that are not easily quantifiable are then further explored in Chapters 7 and 8.

The present chapter begins by introducing the relevant literature and hypotheses. It then describes the data used and estimation approach, followed by the results for development assistance, debt and IMF programmes and conditionalities, including sensitivity testing. The chapter finishes with a discussion of its findings in relation to the existing literature, study limitations and conclusions.

6.2. Abstract

Background

Across Low- and Middle-Income Countries (LMICs), Official Development Assistance (ODA) is growing over time, but so are debt burdens and the number of conditionalities that come with borrowing from the International Monetary Fund (IMF). The United Nations, The World Bank, and a number of Civil Society Organisations and academics have deemed debt levels unsustainable and expressed concern for the ability to finance health under this fiscal pressure. In our study, we jointly analyse the relationships between ODA$^+$ (including funding from the Bill and Melinda Gates Foundation), public external debt, IMF loan conditionalities and key recipient country health financing sources.

Methods

We performed a panel data study of 105 LMICs from 2005-2019, investigating associations between Government Health Expenditure as a Source (GHE-S) and Out-Of-Pocket Payments (OOP) as dependent variables, and a set of ODA$^+$-variables, public external debt stock and servicing, IMF programme participation and conditionalities and covariates as independent variables. We used the Generalised Method of Moments estimator and performed a range of sensitivity tests to check the robustness of our findings.

Results

We found some evidence that ODA$^+$ channelled via the recipient country public sector was associated with reductions in both OOP and GHE-S, measured per GDP. We also found some evidence that increases in public external debt servicing levels per GDP were associated with relative increases in OOP and relative decreases in GHE-S per Current Health Expenditure (CHE). Our main findings showed no relationship between IMF programme participation or conditionalities and GHE-S or OOP. Our findings were variably robust to sensitivity tests.

Conclusions

We confirm previous findings of fungibility of on-budget ODA$^+$ for health and add that both on- and off-budget ODA$^+$ for health also appear to subsidise OOP, all with modest effect sizes. Our findings for debt indicated a small shift in the burden of payment for health services from the government onto the user from increasing public external debt service obligations. This provides some additional empirical support to recent calls for debt resolution among more heavily indebted LMICs to avoid the negative health service access implications for the poor associated with health systems relying on OOP. We encourage more country case studies of the effects of growing debt burdens on countries' ability to finance health.

6.3. Introduction

Each year, international development agencies and International Financial Institutions (IFIs, i.e. the International Monetary Fund (IMF), the World Bank (WB) and others), send billions of dollars of development assistance and foreign credit to recipient countries, aiming to reduce poverty and achieve socioeconomic development, and in the case of the IMF, to achieve macroeconomic stability including stabilising the balance of payments, improve credit ratings and ensure a country's ability to repay its debts (1). Part of this external financial assistance is provided as loans that require repayment, and come with specific policy conditionalities, that often extend beyond the basic terms of repayment. Specifically, loans obtained from the IMF come with loan conditionalities, traditionally involving measures of austerity, fiscal consolidation and decentralization, with emphasis on private sector-led growth. These different external factors: development assistance, external debt and IMF conditionalities, have been on the rise in recent years.

Official Development Assistance (ODA), including for health, has expanded substantially in real terms, in particular after the Covid-19 pandemic (2). So have the public external debt burdens of Low- and Middle-Income Countries (LMICs) (Figure 6.1) (3, 4), leading the United Nations (5) and the World Bank (WB) (6), among a number of civil society organisation and academics (e.g. (7-12)), to express concern of unsustainable debt levels and how this may affect countries' ability to finance health under this growing fiscal pressure. In particular, Sub-Saharan African (SSA) governments have the highest external debt burdens relative to their budgets (Figure 6.1) (3, 4), and this is where health financing is already scarcest (13). Contrary to common beliefs, after a decline in the 2000's, the mean number of structural conditions in IMF programs have increased since 2008, with some countries having experienced more than 1000 total IMF conditions between 1980-2019 (14).

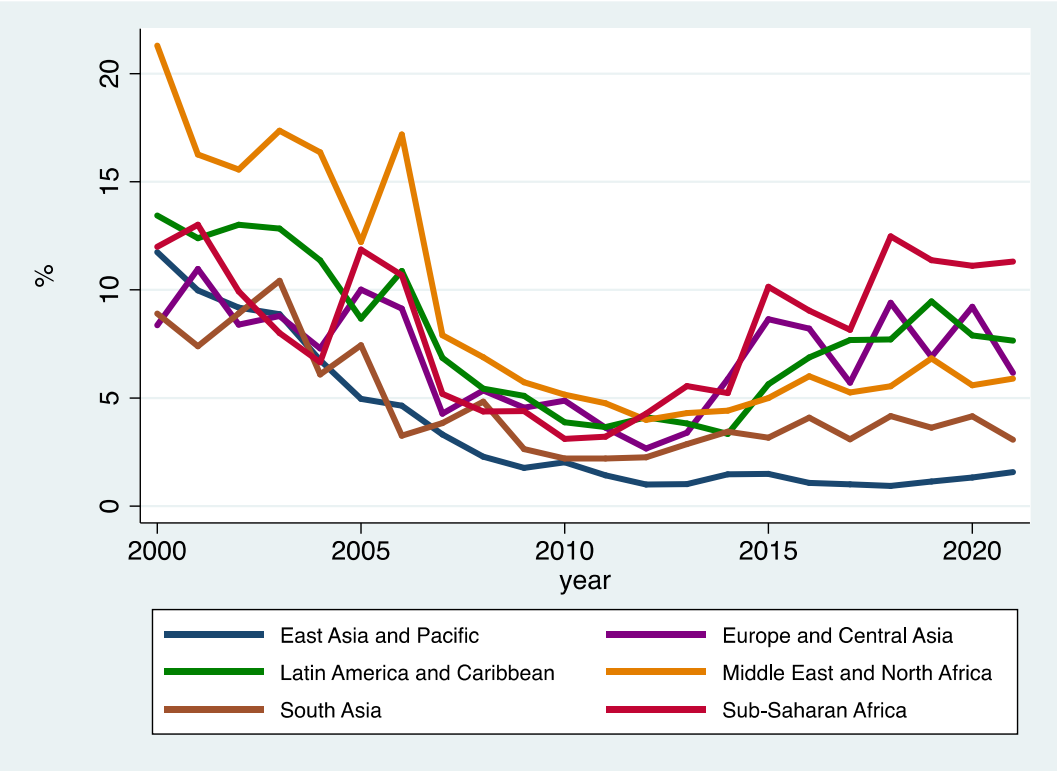

Figure 6.1: Public and Publicly Guaranteed (PPG) external debt service out of total government expenditure in 83 LMICs separated by region, 2000-2021 (%) (3, 4). Data from 83 countries with complete data.

The influence pathways and associated hypotheses explored in this chapter are outlined in detail in Chapter 3. In summary, these pertain to the relationships between ODA, public external debt and IMF loan conditionalities and the levels and balance of Government Health Expenditure as a Source (GHE-S) and Out Of Pocket Payments (OOP) in LMICs. The effects of development assistance for health sectors on domestic government health spending have been rather extensively studied (15-29) (variably disaggregated as government health spending from domestic revenue or from all revenue), generally reporting a negative effect, consistent with fungibility i.e. crowding out/displacement. Several of these authors have shown that displacement only occurs when development assistance for the health sector is channelled through the recipient country government (20, 21, 23, 24, 29) (also done by Patenaude (2021) (28)).

If on-budget development assistance to the health sector can displace GHE-S, then on-budget development assistance to non-health sectors might also displace government expenditure from those sectors to the benefit of the health sector. These relationships are much less studied. Fosu (2007 and 2010) found a positive effect of overall ODA per Gross Domestic Product (GDP) on SSA governments' share allocation to health sectors (30, 31), while

Antunes et al. (2012) found that General Budget Support (GBS) did not significantly affect GHE-S (22).

As for the relationship between development assistance and OOP, Frimpong et al. (2022) found a negative relationship between external health spending and OOP in SSA (32), and Gabani et al. (2024) found negative relationships between Development Assistance for Health (DAH) and different measures of OOP per household spending only when DAH was channelled via the government (33). Patenaude (2021) found no relationship between DAH and OOP at the global level (28), and Ali et al. (2020) found that neither overall development assistance or development assistance for the health sector per capita affected OOP measured as a proportion of private health spending in SSA between 1995-2015 (34). Contrarily, Younsi et al. (2016) found OOP to increase by between 0.01-0.04% (depending on model specifications) for every 1% increase in DAH in LMICs (27), while Xu et al. (2011) found a 1% increase in external funds for health per capita to correlate with a 0.03-0.06% increase in OOP per capita in lower-middle income countries, with no significant correlation in Low-Income Countries (LICs) and Upper Middle-Income Countries (UMICs) (18).

In terms of debt, there is more evidence for a negative relationship between indebtedness and government health spending than the contrary (variably disaggregated as government health spending from domestic revenue or from all revenue), however the datasets used and model specifications vary greatly. A study of 134 LMICs found a negative effect of a higher debt-to-GDP ratio on overall domestic government health financing from 2000-2015 (28). Others have similarly found that the general debt-to-GDP ratio but not interest payments was negatively correlated with social spending per GDP (50 LMICs, 1985-2003) (35). Variable effects were found (positive, negative and insignificant) in another study of overall government debt servicing on government health expenditure across 85 LMICs from 2000-2013 depending on time subperiod and country subset specifications (36). In a selected panel of seven South and Southeast Asian countries from 1980-2010, a study found a 1% increase in debt servicing to be associated with an 0.25% decrease in social sector spending (37). A study of LMICs between 1995-2010 found a 1% increase in per capita general government debt to be associated with a 0.27% increase in Government Health Expenditure (GHE), and a 0.10% increase for GHE-S (25). A study of SSA countries from 1975-94 found that a one-standard deviation in public external debt servicing was associated with nearly one-third reduction in the government share allocation to the health sector in (30), and strong negative effects of predicted debt servicing were also found in a follow-up study (31).

As for relationships between debt and OOP, one study found no significant relationship between general government debt per GDP and OOP (28), while others found a negative relationship in SSA (exact variables not reported for this association) (38).

The effects of IMF programs and loan conditionalities on health financing have been debated for decades. On one side are academics and civil society, generally criticising austerity measures from the IMF for constraining government health financing based on quantitative econometric analysis, qualitative / mixed-methods policy analysis and opinion writing (39-53). There are however some exceptions to this (54, 55), and IMF and WB staff members have rejected the above findings and criticisms and themselves shown that health spending is protected/increases under IMF programs (56-61) (though also with some exceptions (62)). To the best of our knowledge, associations between IMF conditionalities and OOP are unexplored.

None of the identified studies investigate all of our determinant variables of interest jointly, thus not allowing for a joint comparison of effect sizes and directions. Such a comparison allows one to examine which of the examined macro-fiscal indicators most strongly determines dependence on GHE-S vs. OOP, and thereby which might be the most effective policy levers for pursuing Universal Health Coverage (UHC). In general, there are much fewer studies of the effects of the examined macroeconomic indicators on OOP than on GHE-S. Studies rarely specify dependent variables as proportions of Current Health Expenditure (CHE) as we do in this study, and few studies discuss any equity implications of their findings. Any shift in the balance between the main sources of health financing in LMICs: GHE-S and OOP (13), our dependent variables of interest, affects the degree of overall progressivity in the mix of health financing sources, i.e. the degree of alignment with ability to pay, which tends to be higher for tax-based contributions as compared to user fees (63-67). This in turn has implications for financial inequality, health service access and health outcomes, particularly among poorer population groups (67-75). By examining effects on the degree of reliance on the main domestic health financing sources, GHE-S and OOP, out of CHE, our study uses novel model specifications to explore relationships with direct relevance to UHC, financing progressivity and health service access for poor population groups in LMICs.

In this paper, we aim to investigate the relationships between development assistance, public external debt and IMF loan conditionalities and the levels and balance of GHE-S and OOP. We do so by performing a cross-country panel data study of 105 LMICs between 2005-2019.

6.4. Methods

6.4.1. Data sources, time period and variables used

Most of our data were retrieved between 16. October and 1. November[18], 2023. The data availability for our included variables allowed us to examine the time period 2005-2019. The upper bound of our time period was determined by the IMF conditionality dataset (76) and the lower bound by OECD CRS data separated by channel (2). Our dataset included all countries that were counted as LMICs by the WB in October 2023 (n=134) (77), excluding countries with more than five years of missing data in our time period for health financing, development assistance, debt variables, IMF conditionality variables or GDP (n=29), resulting in 105 countries (see Appendix 4 for full list). Data were compiled in a Microsoft Excel (78) spreadsheet and analysed in Stata (79). Table 6.1 shows summary descriptive statistics for the variables used in our models. A detailed variable description, motivation and explanation of tested hypotheses is available in Appendix 4.

Table 6.1: Descriptive statistics for variables used in models.

Variable	Obs	Mean	Std. Dev.	Min	Max
OOP / CHE	1566	40.21	19.4	2.17	84.79
OOP / GDP	1566	2.17	1.4	.13	14.95
GHE-S / CHE	1566	40.23	19.05	4.16	80.5
GHE-S / GDP	1566	2.2	1.41	.14	6.82
ODA⁺ for health (public) / GDP	1573	.36	.59	0	6.34
ODA⁺ for health (civ./priv.) / GDP	1547	.16	.3	0	1.97
ODA⁺ for non-health (public) / GDP	1574	2.38	3.54	0	66.13
ODA⁺ for non-health (civ./priv.) / GDP	1574	.47	.78	0	7.19
PPG external debt service / GDP	1574	1.89	2.51	0	46.71
PPG external debt stock / GDP	1574	25.76	20.08	.12	232.42
IMF conditionalities	1575	12.48	20.08	0	122
IMF programme participation	1575	.35	.48	0	1
GDP per capita	1574	3537.77	3053.67	200.36	15432.25
Infant mortality rate	1575	35.95	23.25	2.4	124.6
Government effectiveness	1575	-.57	.55	-2.32	1.16
Corruption control	1575	-.6	.52	-1.7	1.16
Conflict	1575	.17	.38	0	1
Colonial independence from UK	1575	.26	.44	0	1
Colonial independence from France	1575	.22	.41	0	1
Colonial independence from Spain	1575	.06	.23	0	1

[18] Except for: ODA⁺ for health separated as grants and loans, added on November 10, 2023; US consumer price index data, retrieved on December 5, 2023; country mortality rate data, retrieved on December 20, 2023, and Development Assistance for Health (DAH) from the Institute for Health Metrics and Evaluation (IHME) (https://doi.org/10.6069/HX1C-J716), retrieved on February 28, 2024; ODA⁺ for health channelled via NGO's & civil society and private sector institutions, retrieved February 29, 2024. Additional variables for Heckman selection model retrieved from the WB Databank on March 21, 2024.

6.4.1.1. Variables and data sources

6.4.1.1.1. Dependent variables

We used the following dependent variables Y'_{it}:

OOP per CHE in a given country *i* in year *t* (in %) (model 1). A higher proportion means that in relative terms, more of a country's health financing comes directly from users at the point of care, relative to other sources of health financing.

OOP per GDP (in %; natural logged) (model 2). This variable measures how much households in a country spend on health services out of pocket relative to the overall size of the economy.

GHE-S per CHE (in %) (model 3). This variable measures the level of government health spending out of its own revenue, excluding external transfers, relative to total CHE.

GHE-S per GDP (in %; natural logged) (model 4). This measures the level of government health spending out of its own revenue, excluding external transfers, relative to the overall size of the economy.

Changes in the per CHE-variables reflect relative changes in the burden of payment for health services. Increases can reflect relative decreases in other health financing sources and vice versa, including faster and slower growth rates, and they do not provide any information about the absolute amount of financing.

Increases in the per GDP-variables can also reflect relative decreases in GDP and vice versa, and faster and slower growth rates. However, an increase on average in a health financing source relative to GDP will in our dataset, where year-on-year GDP growth rates were positive in most years, reflect a real expansion of health sector activity financed by OOP or GHE-S respectively.

We used health financing data from the World Health Organisation (WHO) Global Health Expenditure Database (GHED) (13) and GDP data from the WB (13, 77).

6.4.1.1.2. Independent variables

Our independent variables included the following: Official Development Assistance (ODA) plus disbursements from the Bill and Melinda Gates Foundation (BMGF), together ODA$^+$ (80), which counts ODA disbursements (minus debt relief, administrative expenses, in-donor country expenses and promotion of development awareness) plus BMGF grants for health and non-health purposes respectively, measured per GDP (in %; natural logged; lagged). Following the literature, we disaggregated both our health and non-health ODA-variables and associated questions by on-budget and off-budget channel for consistency, with our pathways of interest being the effects of on-budget aid on GHE-S (and in turn on OOP). Data were obtained from the Organisation for Economic Cooperation and Development (OECD) Creditor Reporting System (CRS) database (2). We included Public and Publicly Guaranteed (PPG) external debt service and stock respectively per GDP (in %; natural logged; lagged), obtained

from the WB International Debt Statistics database (4). We also included the number of binding and non-binding conditions in place in a given country-year, obtained from the IMF Monitor conditionality dataset (76). We added IMF participation as a dummy variable for when a country has an IMF programme in place, as measured by the presence or absence of conditionalities as recorded in the dataset.

6.4.1.1.3. Covariates

The following covariates were included: GHE-S per GDP, which was not included when GHE-S was part of the dependent variable due to covariance. GDP per capita in constant 2020 US$ (natural logged) obtained from the WB (77). Infant Mortality Rate (IMR) defined as the number of children dying in their first year of life per 1,000 live births from the United Nations Inter-Agency Group for Child Mortality Estimation (81). Government effectiveness, which is a measure of the perceived quality of government, public and civil services, policy formulation and implementation, measured in standard deviations from the Worldwide Governance Indicators (WGI) database (82). Corruption control, defined as the perceived degree of exercise of public power for private gain and state capture by elite and private interests, measured in standard deviations, also from the WGI database (82). A conflict dummy variable attaining the value of 0 if the number of battle-related deaths in a country-year is less than one per one million population and 1 if equal to or higher, using the Uppsala Conflict Data Program / Peace Research Institute Oslo Battle-Related Deaths Dataset (83). Three binary variables capturing whether a country obtained its colonial independence from the United Kingdom, France or Spain, using Issue Correlates Of War data (84).

6.4.1.2. Variable transformations

As per above, all variables showing a skewed distribution were natural-log transformed. This A) normalised their distribution, and B) eased economic interpretation as elasticities. All financial variables except per CHE-variables entered models as proportions of GDP, similar to other authors (24, 29, 35, 85) (in %; natural logged), to examine the effects of financial flows relative to the size of the economy. This was done primarily to avoid introducing spurious correlations by dividing all financial variables with the same deflator numbers, which would be necessary to adjust for inflation if examining absolute or per-capita amounts. It also allowed for the omission of a population covariate necessary in the case of measuring health financing variables directly, in turn increasing our degrees of freedom. In terms of economic interpretation, our resulting health financing measures reflect real expansions/contractions of health financing sources beyond what would be expected simply as a result of background changes in the size of the economy and following inflation levels. The effects of absolute aid and debt flows may also greatly depend on at what level relative to the size of the economy they occur.

6.4.2. Econometric methods

6.4.2.1. Full model specification

Our full model specification was as follows:

$$
\begin{aligned}
Y'_{it} = {} & \beta_0 + \beta'_1 Y'_{i,t-1} + \beta'_2 ln\left(\frac{ODA^{+} for\ health}{GDP}\right)'_{i,t-1} + \beta'_3 ln\left(\frac{ODA^{+} for\ non\text{-}health}{GDP}\right)'_{i,t-1} \\
& + \beta_4 ln\left(\frac{debt\ service}{GDP}\right)_{i,t-1} + \beta_5 ln\left(\frac{debt\ stock}{GDP}\right)_{i,t-1} \\
& + \beta_6 IMF\ conditionalities_{it} + \beta_7 IMF\ participation_{it} + \beta_8 ln\left(\frac{GHES}{GDP}\right)_{it} \\
& + \beta_9 ln\left(\frac{GDP}{cap}\right)_{it} + \beta_{10} IMR_{it} + \beta_{11} gov.\ effectiveness_{it} \\
& + \beta_{12} corruption\ control_{it} + \beta_{13} conflict_{it} + \beta'_{14} independence\ from'_{it} + \mu_i \\
& + \nu_t + \varepsilon_{it}
\end{aligned}
$$

μ_i is country-specific, time-invariant effects (country fixed effects), ν_t is time-invariant cross-country effects (year fixed effects, e.g. shocks, included as year dummies), and ε_{it} is the error term.

6.4.2.2. Variable reduction

As our full model specification tested multiple hypotheses at once, some of which turned out not to be supported by the results, we ran backward stepwise regressions to generate reduced models. We sequentially removed independent variables with a p-value > 0.2, starting with the variable with the highest p-value. This was done to A) increase parsimoniousness, B) reduce the risk of type II error due to multicollinearity, and C) lower the risk of significant findings being due to multiple comparisons. The resulting reduced form models are presented in Table 6.2. The full model regression results are presented in Appendix 4.

Table 6.2: Two-step system GMM results for reduced form model specifications

Dependent variable	1a) OOP/CHE	2a) Ln(OOP /GDP)	3a) GHE-S/CHE†	4a) Ln(GHE-S /GDP)
L. dependent variable	0.662*** [0.059]	0.928*** [0.061]	0.710*** [0.080]	0.694*** [0.082]
L2. Dependent variable	-	-	0.229*** [0.075]	
L. ln(ODA+ for health (public) / GDP)	-0.412 [0.268]	-0.024** [0.010]	-	-0.026** [0.013]
L. ln(ODA+ for health (civ./priv.) / GDP)	-0.339 [0.215]	-0.012** [0.006]	-	-
L. ln(ODA+ for non-health (civ./priv.) / GDP)	-	-0.038** [0.018]	0.789* [0.467]	-
L. ln(debt service/GDP)	0.725** [0.350]	-	-0.664** [0.287]	-
ln(GHE-S / GDP)	-8.228*** [1.628]	0.072** [0.036]	-	-
ln(GDP/cap)	-1.340 [1.801]	-0.251*** [0.074]	1.395 [2.191]	0.110 [0.218]
IMR	-0.144*** [0.053]	-0.003* [0.002]	-0.019 [0.058]	-0.001 [0.003]
Gov. effectiveness	1.144 [1.420]	-0.002 [0.045]	-1.144 [1.237]	-0.030 [0.063]
Corruption control	-2.241 [1.617]	0.063 [0.059]	3.180** [1.310]	0.054 [0.078]
Conflict	0.387 [0.748]	0.039* [0.021]	-0.064 [0.552]	0.037 [0.031]
Ind. from UK	-1.966 [1.486]	-0.019 [0.045]	0.180 [0.941]	0.041 [0.077]
Ind. from France	0.274 [1.589]	0.043 [0.043]	0.461 [1.164]	-0.083 [0.063]
Ind. from Spain	-0.303 [1.626]	0.018 [0.056]	1.842 [1.150]	-0.004 [0.089]
Constant	-31.033* [16.747]	1.273** [0.535]	-5.071 [17.666]	-0.697 [0.763]
Observations	1429	1429	1356	1460
Countries	105	105	105	105
Instruments	77	97	88	73
Lag limits (years)	5	7	8	7
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
AB-test AR(2) (p-level)	0.944	0.785	0.659	0.194
Hansen test (p-level)	0.402	0.469	0.242	0.346
Diff.-in-Hansen test (p-level)	0.150	0.543	0.908	0.725
F-statistic	495.52***	128.67***	1794.7***	117.58***

AB-test AR(2) = Arellano-Bond test for first-order autocorrelation in the levels equation. Diff.-in-Hansen test: Difference-in-Hansen test for exogeneity of GMM instruments in levels equation. Govt.= Government. IMR= Infant Mortality Rate. Ind. = Independence (colonial). L. = 1-year lag. L2. = 2-year lag. Ln= natural logarithm.

† 2nd-order lag of dependent variable included as independent variable in model 3a to avoid serial correlation as determined by the AB-test.

Windmeijer-corrected robust standard errors in brackets; *p < 0.1, **p<0.05, ***p<0.01. We used a significance level of 0.05 for all regressions and associated discussions, while results significant at the 0.10-level were only discussed for sensitivity tests where main model specification results were significant at the 0.05-level, except for the case of contemporaneous IMF programme participation (appendix), which warranted separate discussion.

6.4.2.3. Estimation strategy

6.4.2.3.1. Generalized Method of Moments

To overcome serial autocorrelation and heteroskedasticity (see Appendix 4), we adopted two-step system Generalized Method of Moments (GMM) estimation (86-91), using fixed effects following the Hausman test (92), employed with the Stata command "Xtabond2" (88). The two-step GMM is a more efficient estimator and has been designed for panel data analysis with a relatively small number of time periods and a larger number of units of observation (countries) (88, 91), as in our case.

All explanatory variables except colonial independence variables and year-dummies were treated as endogenous (GMM-style instrumentation), while colonial legacy and year-dummies were treated as exogenous (Instrumental Variable (IV)-style instrumentation) (88, 93, 94). We

used the Windmeijer-correction to correct for the tendency of two-step system GMM to produce downward-biased standard errors (88, 95). To lower the instrument count, we collapsed the instrument matrix (88, 93, 94, 96). We also applied upper bounds to the number of year-lags used for GMM-style instrumentation (the so-called “lag limit” (88)), and ensured that each model was valid by adjusting the lag limit, guided by the instrument count and the following tests:

We used the Arellano-Bond test to check for first-order autocorrelation in the levels equation (88, 89, 93, 94). We used the Hansen test (86) to explore the validity of our generated moment conditions and avoiding overidentification, ensuring p-values between 0.15 and 0.6 (93, 97, 98). We used the difference-in-Hansen test to ensure exogeneity of the generated GMM-style instruments in the levels equation (88, 96).

As expected, moderate to strong serial correlation was present in our dependent variables. We have explained our approach to this issue in Appendix 4.

6.4.2.3.2. Lag structure

For choosing the number of lags on our independent variables of interest in our main model specifications, we first specified 2-year lags for all of these and then sequentially reduced the lag-level (93, 94). This process showed that a parsimonious lag-specification of 1-year lags for all financial independent variables of interest, without contemporaneous or two-year lagged variable versions, generally, with a few exceptions mentioned in the results section, identified the highest level of significance and optimised the above test statistics. Contemporaneous variable versions, with the noted exceptions, were generally found to be insignificant, or in the case of joint insignificance at both *t* and *t-1*, had lower t-values than at *t-1*. When including both unlagged and 1-year lagged independent variables of interest, strong issues of multicollinearity were encountered, degrees of freedom lost, and issues of overspecification as well as instrument proliferation from inclusion of insignificant explanatory variables substantially reduced the room for manoeuvre in the search for an appropriate model within acceptable diagnostic test parameters, in turn increasing the risk of committing type-II errors. Contemporaneous variable version for financial independent variables of interest were therefore not included. This specification type follows the work of other authors in our field (15, 35, 39, 99). Its consistency and parsimoniousness also limited confirmation bias or “cherry-picking” of significant results, to the extent possible with the GMM method (see limitations). Economically, a 1-year lag of the financial variables of interest also made sense as the fiscal implications of these macroeconomic factors may not be realised until the following year.

IMF conditionalities and IMF programme participation, however, apply to the current financial year, they did not show the same significance patterns for their lags, and were therefore kept unlagged.

6.4.2.4. Diagnostic tests

We performed twelve unit root tests for each dependent variable (48 in total, available in Appendix 4): 4 variations of the Fisher-type test (augmented Dickey-Fuller and Phillips-Perron), Im-Pesaran Shin (IPS) test and Levin-Lin-Chu test – with trend, demeaned with trend, and with or without Akaike Information Criteria-determined lags (Appendix 4). As a significant linear time trend was present in all our dependent variables, we did not perform these tests without accounting for a time trend. All 48 tests rejected the null-hypotheses that panels contained unit roots.

We tested for multicollinearity by calculating Variance Inflation Factors (VIFs) for all models (Appendix 4). This showed the expected collinearity of 1st and 2nd order lags of the dependent variable in model 3a (VIFs 17-18), moderate multicollinearity of ODA-variables in full models (VIFs 5.7-6.4), and moderate multicollinearity of $ln\left(\frac{GDP}{cap}\right)$ in full models (VIF about 5). This among other factors led us to generate the reduced form models as seen in Table 6.2, where VIFs were less than 5 for all variables, except for the dependent variable lags in model 3a, which were necessary to convincingly pass ($p>0.15$) the Arellano-Bond test for serial correlation in the levels equation. This approach should have adequately addressed the issue of multicollinearity and the associated risk of Type II error, and we did find a number of significant correlations. Correlation matrices are available in Appendix 4.

We tested for selection bias into an IMF programme using Heckman selection models (55, 100, 101) (described in Appendix 4). The results of these tests were insignificant, meaning that unobserved variables that make IMF programme participation more likely were not significantly associated with our dependent health financing variables, and an Inverse Mills Ratio was therefore not included in our main regressions.

6.4.2.5. Sensitivity analysis

We ran a series of sensitivity tests and robustness checks to critically interrogate the internal validity of our findings.

We ran our models with no lags and with 2-year lags on the independent variables of interest. We examined the robustness of our results to changing the number of generated GMM-style lags by altering the lag limit.

We ran our models with all financial variables, including dependent variables, being per capita instead of per GDP, as is often also done in the literature (e.g. (15, 102)). We used the same US$ Consumer Price Index (CPI) data for deflation of all per-capita financial variables (77).
We tried swapping IMR with Under-5 Mortality Rate (U5MR) (81) and Maternal Mortality Ratio (MMR) as alternative health need indicators (103).
We explored the effect of using alternative measures of conditionality, i.e. including only binding conditions or not, and attributing different weights to binding vs. non-binding conditions, as binding conditions could be more influential than non-binding conditions (76).
To adjust for any regional and income group effects on our dependent variables, we ran our models with a regional dummy for SSA instead of colonial independence dummies; with Lower Middle-income Country (LMC) and Low-Income Country (LIC) WB income group dummies instead of colonial independence dummies; and without any of these dummies altogether, as they were generally found to be insignificant.
We explored a battery of interaction terms between our main independent variables of interest and the region being SSA, being a LIC, having a higher degree of government effectiveness, having less corruption, and having a higher level of GHE-S relative to GDP. These tested the respective sets of hypotheses that ODA^+ for health, PPG external debt service and IMF conditionality could have different effects on GHE-S and OOP under these five conditions. For example: ODA^+ for health could displace GHE-S more in SSA compared to other regions; debt service could shift the burden of payment more from the government onto the user in LICs; more effective governments could be subjected to milder conditionality with less impact on health financing – or could implement conditionality more effectively resulting in a larger impact; ODA^+ for health could be more effective at reducing OOP in less corrupt countries; and debt servicing could have differential impact on the health system payment pattern at different levels of GHE-S.
We ran our models without log-transformation.
We tested the effect of using US GDP deflator data instead of US consumer price index data for deflation (77).
We tried aggregating our ODA-variables into just health and non-health purposes, as was done in some of the earlier fungibility literature (e.g. (15)).
Finally, we tried adding Inverse Mills Ratios to our full models to adjust for any selection bias for IMF programme participation present even at a non-significant level (i.e. $p>0.05$).

Regression outputs were exported using the Stata command “Asdoc” (104) and are available in Appendix 4.

6.5. Results

Table 6.2 shows the results of our four final reduced form model specifications. The results of our full model specifications are available in the Appendix 4, and these are described in the sensitivity analysis section (6.5.4). Findings are summarised for each set of independent variables of interest along with sensitivity testing. Significant findings for our covariates are described in Appendix 4.

6.5.1. Official development assistance

In our analysis of ODA-variables, we found some evidence that ODA$^+$ for health channelled via the recipient country public sector was significantly associated with a reduction in OOP expenditures as well as a decrease in GHE-S measured as a share of GDP (evidence of displacement of both). Specifically, we found that a 1% increase in the lag of ODA$^+$ for health purposes disbursed via the recipient country public sector per GDP was associated with a -0.024% reduction of OOP/GDP (p=0.02), and a -0.026% decrease in GHE-S/GDP (p=0.045). When channelled via the civil/private sector, the negative association with OOP/GDP remained but not with GHE-S/GDP, i.e. there was no evidence of off-budget ODA$^+$ for health leading governments to lower GHE-S. We also did not find any evidence for our hypothesized positive effect of on-budget ODA$^+$ for other purposes than health on GHE-S. We found no significant association between ODA$^+$ for health via the public sector per GDP and OOP/CHE or GHE-S/CHE. Overall, effect sizes were small.

6.5.2. Debt

For debt, we found that a 1% increase in lagged PPG external debt servicing per GDP was positively associated with a 0.007 %-point increase in OOP/CHE (p=0.041). It was also associated with a -0.007 %-point decrease in GHE-S/CHE (p=0.023).

Lagged PPG external debt servicing did not correlate with the remaining dependent variables. The level of PPG external debt stock per GDP was not associated with any dependent variables. Again, effect sizes were small.

6.5.3. IMF programmes and conditionalities

IMF programme participation and the number of IMF conditionalities were removed during our model reduction process, as they were not found to significantly influence any dependent variables in our full models or in sequential model reduction steps.

6.5.4. Sensitivity testing

6.5.4.1. Full models, alternative lag specifications and covariate swaps

Our significant results for ODA-variables were robust to some specification changes but not to others (Appendix 4 and below). The significant negative association between on-budget

ODA+ for health purposes per GDP with GHE-S/GDP remained in our full model, but not for OOP/GDP (p=0.086).

Our finding that on-budget ODA+ for health purposes per GDP was significantly associated with a reduction of OOP/GDP and decrease in GHE-S/GDP was also present at the 2nd lag, but not in a contemporaneous specification. Its correlation with OOP/GDP was robust to increasing the GMM-style lag limit, but not to decreasing it, and it was robust to most but not all covariate swaps (Appendix 4). Its negative correlation with GHE-S/GDP was only robust to increasing the lag limit by 1 but not to decreasing it, however it was robust to all covariate swaps (Appendix 4).

The significant positive correlations between lagged PPG external debt servicing and OOP/CHE and negative with GHE-S/CHE were sensitive to some model modifications with the latter being more robust (Appendix 4). The significantly positive association between lagged PPG external debt servicing per GDP and OOP/CHE was not robust to changes in lag limits, and only robust to excluding/swapping colonial history variables but not mortality indicators. The negative association with GHE-S/CHE was robust to increasing, but not decreasing lag limits, and it was robust to all covariate swaps. None of our debt variables were significant at the 2-year lag or unlagged. The variables were insignificant in full models (the positive OOP/CHE correlation for debt servicing was near-significant at p=0.057).

We found a borderline significant negative association between IMF programme participation and GHE-S/CHE only in our full model (p=0.08), which was significant in a contemporaneous full model version (-1.13 %-point decrease from IMF participation (p=0.029) (Appendix 4). In this model version, the finding was still present at GMM-style lag limits 3, 4 and 5, but not 2 and 6 (model overspecified at lag limit 6). It was robust to most covariate swaps. We checked for reverse causation, which was not present. IMF variables were not significant at the 1st or 2nd lag and did not become significant by modifying lag limits.

6.5.4.2. Interaction terms

None of the tested interaction terms had any robustly significant effects on any of our relationships of interest within acceptable model test parameters (Appendix 4).

6.5.4.3. Alternative variable specifications

When measuring our financial variables per capita instead of per GDP, including dependent variables, we found some evidence of crowding out/displacement from other sectors benefiting the health sector: lagged ODA+ for non-health purposes channelled via the public sector per capita had a positive association with GHE-S per capita (semi-elasticity: -0.0004,

p=0.019) (full model). Similar to our main findings, lagged debt service per capita had a negative association with GHE-S/CHE (p=0.02). Our findings for ODA+ for health via the public sector were not present when specifying per capita.

6.5.4.4. No log-transformation

When measuring our variables directly and not log-transformed, including dependent variables, this meant that we deviated from much of the literature in our field and introduced substantial right-skew of many variables into the models. The findings with this specification deviated substantially from our main model findings. We confirmed that no unit root was present for direct dependent variables. We were unable to arrive at a specification for model 1 that convincingly passed diagnostic tests without overspecification. We again found a significant negative correlation between ODA+ for health channelled via the public sector per GDP and OOP/GDP in both reduced and full models. We also found a new positive association between IMF programme participation two years prior and OOP/GDP (0.17 %-points, p=0.001). We found a new significant negative association between lagged PPG external debt stock per GDP and GHE-S/CHE (-0.06 %-points, p=0.015), and a new positive association between ODA+ for health per GDP channelled via the civil/private sector and GHE-S/GDP (0.17 %-points, p=0.037).

6.5.4.5. Alternative deflation data

Using US GDP deflator data instead of US consumer price index data for deflation of per-capita variables had no significant effect on any of our results (77).

6.5.4.6. Aggregating ODA-variables

When aggregating our logged ODA-variables into just health and non-health purposes irrespective of channel of assistance, the “fungibility effect” of a decrease in GHE-S/GDP from an increase in lagged ODA+ for health per GDP was not found again, while the negative association with OOP/GDP remained (p=0.01) (Appendix 4). Again, the lag of debt service per GDP was positively associated with OOP/CHE (p=0.04), but no longer with a decrease in GHE-S/CHE.

6.5.4.7. Adding Inverse Mills Ratios

Finally, adding Inverse Mills Ratios to our full models did not cause any substantive changes to our overall results or conclusions.

Apart from when changing the variable being measured (per capita, not log-transformed, aggregated etc.), effect sizes did not change substantially in sensitivity tests[19].

[19] Some changes in coefficients and p-values were seen when including Inverse Mills Ratios, which was most likely due to the loss of degrees of freedom resulting from the inclusion of new explanatory variables with incomplete data for our Heckman selection model and the following need to adjust some model lag limits to avoid overspecification (see Appendix 4).

6.6. Discussion

The objective of this study was to explore the relationships between external development financing, public external debt, loan conditionalities from the IMF, and key recipient country health financing sources. We discuss our main findings in relation to the literature in the below sections. Policy implications and research recommendations are discussed in the Conclusions section.

6.6.1. ODA⁺ for health and health financing sources

Our first main finding was that both lagged on-budget and off-budget ODA⁺ for health were associated with reductions in OOP/GDP, but not OOP/CHE. This offers some evidence that these types of assistance from External Development Partners (EDPs) modestly displace or subsidise OOP, but do not do so in a manner in which the degree of reliance on OOP out of total CHE is reduced. The latter could at least in part be explained by the finding that on-budget ODA⁺ for health also displaces GHE-S (measured per GDP) with a negative elasticity of a comparable magnitude, although effects on other health financing sources were not investigated.

These findings broadly align with results from two previous studies. One panel study showed a negative relationship between external health spending and OOP in SSA (32), and a fixed-effects/pseudo-panel study based on household survey data among 65 LMICs showed a negative relationship between on-budget DAH (DAH-G) per capita and health OOP per total household spending (33). Compared to the latter study, our findings however extend to also show an OOP-displacing effect for off-budget development assistance to the health sector.
Our findings however differ from other authors, but methodological differences readily explain this, and direct comparisons are difficult to make. Studies have found no association between DAH-G or DAH-NG and OOP on either a log-log scale or level scale[20] (28), and significant positive relationships between total DAH and OOP measured directly (i.e. without denominator) (27) and between external funds for health / cap (essentially DAH/cap) and OOP/cap only in Lower-MICs[21] (18).

[20] Most of these results suffer from serial correlation in the levels equation.
[21] Xu et al. split their panel into subgroups with only 27 countries and 329 observations in some groups. Splitting our panel would necessitate a change of estimation method to an alternative IV regression method e.g. two-stage-least-squares (2SLS), which behaves inappropriately in unbalanced panels and requires homoskedasticity for efficiency ((88)). This would result in losing the superior performance of GMM in the face of unbalanced data, heteroskedasticity, serial correlation and endogeneity (88), which would further limit the scope for causal inference than is already the case for GMM estimation on observational data.

All of the cited studies differ internally and from ours in model specification, variable transformation, country inclusion and grouping choices, time period, and extent of diagnostic and sensitivity testing performed. Common to the latter three articles (18, 27, 28) is also that all/nearly all of their GMM models have Sargan/Hansen p-values of 1.00, indicating overspecification, and without a description of an approach to limit instrument proliferation (88, 96). Other authors have measured OOP as a proportion of private health spending, which again renders direct comparisons challenging (34). Our finding was not fully robust to sensitivity tests, and we resultingly advise some caution when interpreting this finding and its potential policy implications.

Our second main finding was that lagged ODA$^+$ for health channelled via the recipient country public sector was associated with reductions in GHE-S/GDP. This effect was not found when channelled outside of government or when measured jointly, i.e. irrespective of channel. This supports the interpretation of a modest displacing effect specifically of on-budget ODA$^+$ for health on GHE-S (fungibility). This finding aligns with the majority of the extensive, and at times conflicting, body of literature on the fungibility of development assistance to the health sector (15-29). In particular, the fact that we were unable to identify fungibility when not distinguishing between on- and off-budget development assistance for health aligns with similar/analogous findings by others (20, 21, 23, 24, 28, 29). A government can only respond to what it can see, and if ODA$^+$ for health is distributed directly from an EDP to the civil or private sector, this may not be in clear view for the government and may thus not trigger any fiscal redistributions.

The caveat needs to be made that some of the above literature has also faced methodological criticism (29, 98), and the same concerns mentioned in the previous section again apply to the same studies[22]. Again, our finding was not fully robust to all sensitivity tests, and the effect size was small. We have however subjected the fungibility hypothesis for on-budget ODA$^+$ for health to extensive scrutiny, going beyond existing studies, and our main findings are confirmatory.

Of note, in an alternative specification measuring our variables per capita, we did not find fungibility of ODA$^+$ for health, but instead that ODA$^+$ for non-health purposes provided via the public sector had a significant positive association with GHE-S, in this specification supporting

[22] Further quality issues deserve mention such as no/limited sensitivity testing of results ((16, 105)), or using two-way, fixed effects Generalised-Least Squares (GLS) estimation of observational data to make causal claims and policy recommendations ((16)), which has been called into question ((106)).

the interpretation that external funding injections to other public sectors allow governments to shift some additional funds to the health sector. Our main specification did not confirm this relationship. This highlights the sensitivity of these types of models to variable choices. The fungibility hypothesis for on-budget development assistance to the health sector is now well supported in the literature, and future research could further scrutinize its inverse: if development assistance to non-health sectors free up domestic funds to the benefit of the health sector.

6.6.2. Debt and health financing sources

We found evidence that increases in lagged public external debt servicing levels per GDP were associated with relative increases in OOP and relative decreases in GHE-S measured as proportions of CHE. The association with GHE-S/CHE was more robust than that for OOP/CHE, and neither was fully robust to all sensitivity tests. The fact that OOP/CHE was found to increase by a similar amount as GHE-S/CHE decreased points to the possibility of changes in OOP/CHE being mediated by changes in GHE-S/CHE. Overall these findings provide some novel cross-sectional evidence in support of the hypothesis that increasing public external debt servicing reduces the remaining envelope for other government expenses, including for public health, resulting in a shift in the burden of payment for health services from the government toward the user. This can be seen as worsening the overall progressivity of health financing. On average, OOP and GHE-S each constituted 40% of CHE across our sample of country-years, meaning our dependent variables reflect the bulk of health financing across the studied LMICs and years.

The effects seen were however not identifiable when measuring GHE-S and OOP per GDP or per capita, which challenges the above interpretations, unless the effects from debt are indeed more compositional and relative in terms of government budget allocations and overall health system payment patterns, but neutral in proportion to increases over time in economic output and population.

This part of our findings broadly align to some extent with the majority of the relevant identified econometric literature. This includes a regional study that found negative associations between general debt servicing and social spending in 7 South- and Southeast Asian countries[23] (37), and three studies that found negative associations between debt burdens in SSA and countries' share allocation to the health sector out of the total government budget (30, 31, 38)[24]. One of these reported a negative relationship between the public debt burden

[23] Caveat for limited reporting of GMM diagnostic tests.
[24] About ¾ of observations missing for panel (172 observations across 43 countries and 15 years).

and OOP in SSA as a robustness check, though without showing those regression results (38). At the global level, another study found a negative association between the general government debt-to-GDP ratio and domestic government health financing across 134 LMICs, and no significant relationship with OOP (28). Others have had mixed findings for public health spending (36) (same methodological caveats apply as above)[25], and one study has found positive associations with GHE-S using FE-2SLS (above caveats apply) (25).

Differences between previous findings and ours may likely be due to significant differences in data used, model specification and estimation technique, and we have addressed some methodological issues that may have been present in previous studies, including instrument proliferation. Viewed jointly, while our study adds to the side of the econometric literature finding negative (and absent) links between debt and government health financing, we deem the identified literature, our study included, inadequate for forming a final, general verdict on this relationship. Rather, the cross-sectional evidence available, ours included, should be seen as one type of evidence improving our understanding of these relationships, that can then be supplemented by other types of evidence, e.g. country-case studies.

6.6.3. IMF programme participation, conditionalities and health financing sources

We found no association between IMF programme participation or number of IMF conditionalities and our dependent variables in our main models. Only in a contemporaneous full model version did we find a partially robust, significant negative association between IMF participation and GHE-S/CHE, and not with GHE-S/GDP (Appendix 4). Viewed jointly, our findings do not convincingly support the hypothesis of a constraining effect of IMF programmes and conditionalities on GHE-S, nor of a promotion of OOP.

As with the above literature, there are numerous differences in data used, specification choices and estimation methods amongst previous studies of IMF effects on health financing, with equal divergence in the empirical findings from econometric studies. Our mostly negative findings align most with IMF/WB's own work, that has used a variety of methods generally finding that government health spending is not impacted under IMF programs, or even that it increases under IMF programs (the latter of which our findings do not support), including from its Independent Evaluation Office (57-61) (although with some exceptions (62)). While academics have at times found similar results (54, 55, 108), criticisms and findings of IMF

[25] Reported Sargan statistics were all 1.000, no approach to instrument curtailing was described, and for two-step system GMM (same as our method) under conditions of heteroskedasticity and serial correlation in the error term, the Hansen test should be relied upon (107)

programmes and conditionalities constraining government health spending prevail on the part of academics and civil society (39-53).

While this debate is yet unresolved in the econometric literature, qualitative investigations into the health financing impacts of IMF conditionality are scarce (e.g. (39)). Such studies might help elucidate why findings differ, and more importantly generate learnings at the country level for which IMF policies and conditionalities help promote pooled health spending and which do not.

6.6.4. Limitations

Using observational data, no matter the level of sophistication of the statistical techniques applied, limits the scope for causal inference compared to using experimental data. We have sought to use the optimal econometric methods currently available for exploring our research questions with the cross-sectional data available. The system GMM estimator eliminates time-invariant confounders (fixed effects) from the first-differenced but not the levels equation, while time-variant confounders remain (88, 109). Our choices of covariates and sensitivity testing with variable swaps should have addressed some confounding, but residual confounding will remain in ours and any other model. As an example, there are limitless different health needs that may drive both health spending but also development assistance for health, all of which cannot be captured by any single variable. No sensitivity tests swapping single variables or adding a few can ever fully address this, however the GMM estimator partially mitigates this issue by instrumenting, addressing the issue of endogeneity and estimating a purer and more accurate relationship between independent and dependent variables (110).

By prioritising valid application of the best available estimator for our data, our study was limited in its ability to inform sub-group questions, such as differences in effect across all regions and income groups. This may have caused us to overlook especially regional effect modification present in other regions than SSA. We thus advise caution in making inferences at the regional level - and in particular at the country level, as for other global-level studies.

We have addressed and discussed the potential issue of selection bias into IMF programmes, and our choice of covariates should have partially addressed the issue of selection bias in terms of who obtains development assistance including loans. Residual selection bias will however necessarily remain. Measurement error is also an omnipresent and underrecognized issue in the general development economic and global health economic literature (111). We have used standardised data from the best available data sources for our research questions, removed countries with significant missing data, performed a range of sensitivity tests, and

used GMM that helps overcome this source of endogeneity (112), however some degree of bias from measurement error will remain by default (111). Also, what is counted as ODA constitutes a heated topic of debate, and measurement methods change over time (113). However, we had to rely directly on OECD data to be able to disaggregate on- and off-budget ODA.
We have explored whether non-linear relationships were present by examining relevant interaction terms, however further non-linear relationships are conceivable.

Finally, the variables in our main reduced form models did not turn out significant in ways that allowed for a deeper comparison of effect sizes between independent variables as envisaged. Our study was thus limited in its ability to answer comparative questions such as: “Does aid displace government health spending more than debt servicing constrains it?”, similar to e.g. (30). Alternative study designs, perhaps with longer panels if omitting IMF variables, might help address this.

In summary, we believe our analysis has provided the foundation for a careful causal interpretation for some of the associations identified, with some caveats, as described in the conclusions.

6.7. Conclusions

6.7.1. Policy implications

Our study provided confirmatory evidence for the existing fungibility hypothesis of on-budget ODA^{+} for health with GHE-S, and added some evidence that both on- and off-budget ODA^{+} for health also appear to displace or subsidise OOP, when measured per GDP. The latter should encourage EDPs in the sense that while it appears they do to some extent act as subsidising agents for recipient governments, it also seems they help subsidise health service costs paid with the most inequitable source of financing in LMICs.

Providing GBS overcomes the issue of fungibility of sectoral funding disbursements at the expense of EDP control of funds. Agreements for minimal levels of government health spending could accompany GBS to ensure benefit to the health sector. Co-financing requirements is an available alternative policy tool for addressing fungibility. This should however ideally only be considered in adherence with the Paris and Accra principles for development cooperation, particularly the principle of country ownership (114), and keeping in mind the broader fiscal repercussions of multiple EDPs requiring co-financing for their preferred policy area. Importantly, while displacement of GHE-S was only identified for on-

budget ODA$^+$ for health, this should not be interpreted as an argument for providing off-budget ODA$^+$ for health, as this may be associated with inefficiencies from poor/absent coordination, duplication of efforts, and may undermine domestically owned development plans for the health sector.

We also provided novel evidence that public external debt servicing led to relative shifts in the mix of domestic health financing sources from GHE-S toward OOP, measured per CHE, however not when measured per GDP or per capita. Our results thus point to a compositional effect in health system payment patterns from government onto user, found to be neutral in proportion to economic output and population, but implying decreasing progressivity in the mix of domestic health financing sources with increasing public external debt servicing obligations. This new identified relationship provides modest added support to the argument for avoiding large public external burdens from a health financing perspective and should be considered by both external creditors and governments in LMICs. The argument has been made by the United Nations (5), The WB (6), and a number of civil society organisations and academics (e.g. (7-12)), that the critical debt levels in many countries may put government health financing at risk, and resolution is needed to ensure that all public sectors, health included, can deliver their essential services. Higher debt servicing obligations can be avoided by a number of ways, including more concessional terms of lending, debt restructuring, debt cancellation, debt-to-health swaps, and more (115, 116). The latter works to ensure that health sectors do indeed benefit from funds freed up from debt relief.

Our main findings showed no relationship between IMF programme participation or conditionalities and GHE-S or OOP. The latter absent relationships with OOP have not been explored before this study. Only in an alternative model specification did we find evidence of IMF programme participation, not the number of IMF conditionalities, affecting GHE-S per CHE negatively, and not GHE-S per GDP. Overall, these findings mostly support the interpretation that GHE-S is not impacted by IMF programmes, and that OOP is not promoted either. For the IMF, the obvious policy implication is that they should focus on developing policy at the central fiscal level that supports GHE-S increases across a Global South where government health spending levels are wholly inadequate for meeting population needs, particularly in LICs (13, 117-119). The predominant IMF policy of using social spending floors seemingly does not achieve increases in GHE-S on aggregate, and other policy measures such as dedicated health spending floors, or objectives for GHE-S increases in adjustment programs for low-spending countries should be considered, as allowed within the IMF mandate.

6.7.2. Research recommendations

While our study adds knowledge on public external debt impacts on domestic health financing at the global level, future studies should focus on exploring how domestic health financing is impacted by debt obligations in individual countries. Negative effects have already been identified in some countries in SSA (120-122). As debt burdens grow and warnings of health financing impacts are released, a key role of researchers would be to elicit single country experiences, both showing any negative implications, but also identifying policies that have been successful at insulating health sectors from debt servicing obligations.

Similarly, while our study has explored impacts of IMF programmes and conditionalities on domestic health financing sources at the aggregate, global level, future studies could unpack the complexity of IMF policy at the country level from a health financing perspective, using qualitative or mixed methods. Such studies might help inform which particular policies support increasing progressivity of health financing sources, and which do not, which would be helpful for informing future IMF policy making that aligns with health sectoral objectives for UHC.

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Please note that a cover sheet must be completed for each research paper included within a thesis.

SECTION A – Student Details

Student ID Number	lsh1601722	**Title**	Dr.
First Name(s)	Frederik		
Surname/Family Name	Federspiel		
Thesis Title	External Development Partner and International Monetary Fund Influence on Domestic Health Financing Sources in Low- and Middle-Income Countries: Panel Data Analysis and Case Study in Senegal		
Primary Supervisor	Josephine Borghi		

If the Research Paper has previously been published please complete Section B, if not please move to Section C.

SECTION B – Paper already published

Where was the work published?			
When was the work published?			
If the work was published prior to registration for your research degree, give a brief rationale for its inclusion			
Have you retained the copyright for the work?*	Choose an item.	Was the work subject to academic peer review?	Choose an item.

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SECTION C – Prepared for publication, but not yet published

Where is the work intended to be published?	Health Policy and Planning
Please list the paper's authors in the intended authorship order:	Frederik Federspiel, Josephine Borghi, Elhadji Mamadou Mbaye, Henning Tarp Jensen, Melisa Martinez Alvarez

Stage of publication	**Undergoing revision**

SECTION D – Multi-authored work

For multi-authored work, give full details of your role in the research included in the paper and in the preparation of the paper. (Attach a further sheet if necessary)	I designed this study as Principal Investigator (PI) in collaboration with my supervisors and co-PI in Senegal. I produced the study protocol and research ethics applications with input from supervisors and co-PI. I collected, analysed and interpreted the data, and wrote the first draft paper, with the input necessary along the way from my supervisors. My supervisors, local co-PI and I then critically revised the article, with me being responsible for performing the revisions necessary.

SECTION E

Student Signature	[redacted]
Date	20/9-2024

Supervisor Signature	[redacted]
Date	27/09/2024

7. Chapter 7: External Development Partner Influence on Domestic Health Financing Sources in Senegal: A Mixed Methods Case Study

7.1. Chapter overview

Chapter 6 found some evidence at the global level for Official Development Assistance^{+} (ODA^{+}) for health displacing both Government Health Expenditure as a Source (GHE-S) and Out Of Pocket payments (OOP), as well as a slight shift in the burden of payment from the government toward the user resulting from debt servicing obligations. The study was however unable to directly investigate underlying mechanisms of effect and non-financial mechanisms that are not easily quantifiable and not measured and available in cross-country panel datasets. The following chapters seek to build on the understanding developed in Chapter 6 using a mixed-methods approach in a case study in Senegal.

Chapter 7 presents the first part of this case study. It uses interviews, document review and descriptive quantitative analysis to address the second objective of this thesis: To explore the mechanisms of External Development Partner (EDP) influence on the mix of domestic health financing sources in Senegal. It first introduces the relevant background literature and concepts, its analytical framework, study setting and methods, before summarising its findings structured by the four identified influence mechanisms: setting aims and standards, lobbying/negotiation, providing policy/technical advice, and providing external financing. It then discusses its findings in relation to the literature, to then make recommendations encouraging the use of the developed framework to help identify dynamics and areas of policy incoherence in other contexts that do not optimally support progress toward Universal Health Coverage (UHC).

Chapter 8 further unpacks the influence mechanisms identified in this chapter by specifically looking at the health financing implications from the external financing modality of lending and exploring the specific influence of the International Monetary Fund (IMF) and the World Bank (WB) on domestic health financing sources in Senegal.

Chapter 7 has been submitted to Health Policy and Planning and re-submitted after implementing reviewer comments. Minor language and formatting changes from the re-submitted version have been made to ensure consistency and clarity across chapters in the thesis.

7.2. Abstract

Background

Sustainable and equitably contributed domestic health financing is essential for improving health and making progress towards Universal Health Coverage in Low- and Middle-Income Countries. In this study, we explore the pathways through which development partners influence the mix of domestic health financing sources in Senegal.

Methods

We performed a qualitative case study comprised of 32 key stakeholder interviews and a purposive document review, supplemented by descriptive statistical analysis of WHO and OECD data on health financing sources in Senegal. We developed a novel framework to analyse the different mechanisms and directions of development partner influence on domestic health financing contributions.

Results

We identified development partner influence via four mechanisms: setting aims and standards, lobbying/negotiation, providing policy/technical advice, and providing external financing. Overall, development partners worked to increase tax-based government contributions and expand community-based health insurance (CBHI), which is seemingly equity enhancing. Fungibility and intrinsic equity issues related to CBHI may however limit equity gains.

Conclusions

We encourage stakeholders in the health financing sphere to use our framework and analysis to unpack how development partners affect domestic health financing in other settings. This could help identify dynamics that do not optimally enhance equity and support progress towards UHC, to help achieve more coherent policy-making across all domains of development partner activities in support of UHC. Future research should investigate the role of international creditors, lending and loan conditionalities on domestic health financing in recipient countries, including equity implications.

7.3. Introduction

Equity in health financing contributions has long been recognized as essential to improving health indicators and making progress towards Universal Health Coverage (UHC) in Low- and Middle-Income Countries (LMICs), protecting patients and their families from financial risk (1-4). We define equity of health financing contributions as funds being contributed in proportion to ability to pay; being prepaid so funds can be made available to those who need it irrespective of their ability to pay at the time of seeking a health service; and being pooled across many individuals to allow for financial risk sharing (3, 5-12).

Many recipient countries of development assistance are highly donor-dependent for their health sector financing (13), and development partners exert great influence over national health policy (e.g. (14-16)) including health financing policy (e.g. (15, 17-25)) in various contexts including Senegal. In a recent commentary by (21), the authors explain how Community-Based Health Insurance (CBHI) in Senegal was pushed by external development partners, stifling progress toward UHC by more than a decade due to poor coordination and intrinsic equity issues with CBHI.

In the quantitative literature, some econometric studies have examined the relationship between external and domestic financing in the form of fungibility, i.e. whether the health budget increases by less than the amount injected as development assistance for the health sector due to an associated decrease in Government Health Expenditure as a Source (GHE-S), i.e. from domestic revenue (e.g. (26-29)), with most authors finding a fungibility effect. Other studies have examined the relationship between external health financing and Out-Of-Pocket payments (OOP), finding no effect or a crowding-in effect (30-32). However, these studies do not go beyond relationships between financing flows to explore the different potential pathways of development partner influence.

Understanding through which mechanisms development partners influence domestic health financing in aid recipient countries is important: This can help to inform development partner efforts, ensuring they do indeed work toward sustainable, equitably contributed health financing in the countries they support.

Building on the above work and using the case of Senegal, our study aims to explore through which pathways development partners may influence the composition of domestic funding sources for health, and whether this influence has been equity enhancing or not in the case of Senegal. We use qualitative methods (interviews and document review), supplemented by

descriptive statistics to examine the presence, pathways and nature of external development partner influence on domestic health financing contributions, since 2000. We first describe the main financing sources and mechanisms in Senegal. We then introduce and apply a novel analytical framework to identify and examine the different ways development partners may exert influence on domestic health financing contributions in Senegal.

7.4. Methods

7.4.1. Equity definition

As explained above, we define equity of health financing contributions as funds contributed in proportion to ability to pay, that are prepaid and pooled. This implies cross-subsidies of health funds from rich to poor and from the healthy to the sick (33, 34). With this definition, OOP payments are considered least equitable, as they do not take into account a person's ability to pay, they are not prepaid and there is no pooling of funds (3). Health insurance is more equitable than OOP, but to a varying degree depending on the level of contributions made relative to ability to pay of insurance pool members, the level of cross-subsidy from rich to poor, and the size of pools.

Government health financing is considered most equitable, as taxes are overall progressive, although VAT and some excise taxes can be regressive. The individual benefiting from a fully tax-funded health service experiences no personal financial cost at the point of care, and funding pools can be as large as covering a whole nation's population, resulting in maximal risk sharing and cross subsidy across the income- and wealth spectrums of a nation. We thus consider donor influence on the composition of funding sources toward more government financing and less OOP, and support for pooled financing mechanisms over no pooling as equity enhancing.

7.4.2. Analytical framework

The framework used in this study for analysing development partner influence on domestic health financing contributions is illustrated in Figure 7.1.

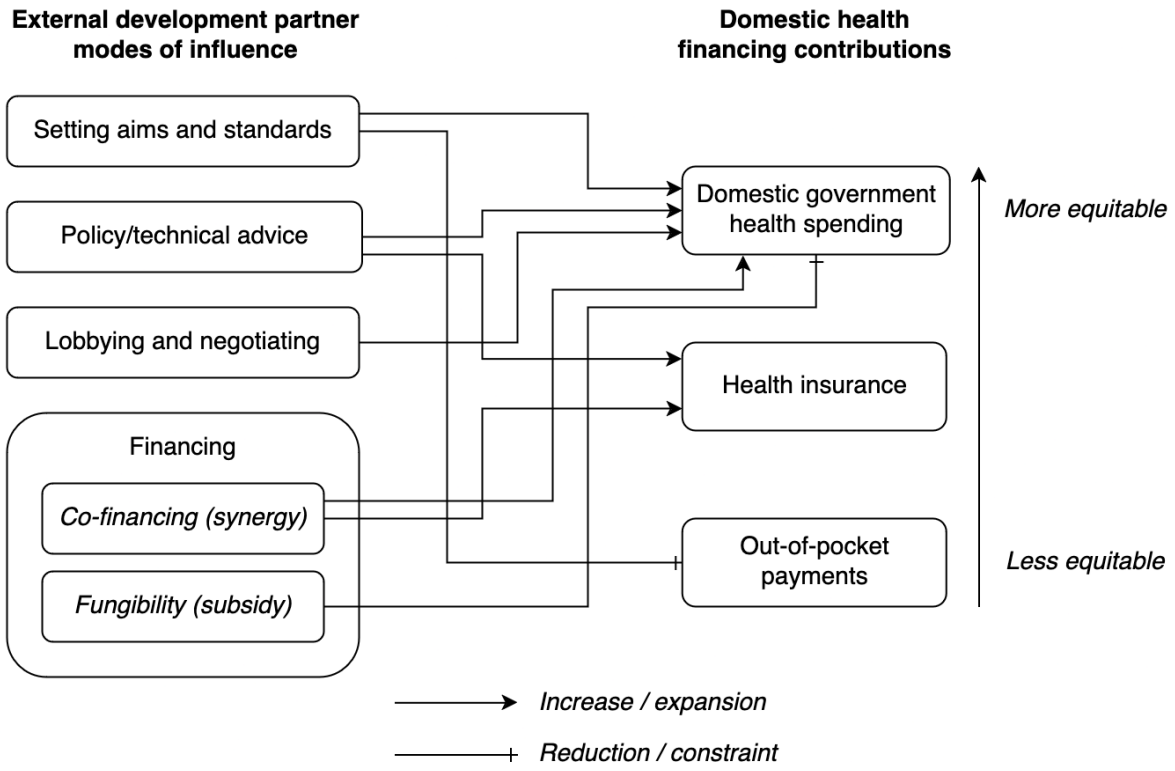


Figure 7.1: Framework for analysing external development partner influence on domestic health financing contributions. Development partners can influence domestic health financing contributions via setting aims and standards, advising, lobbying and negotiating, and providing financing. Development partner financing may have a synergistic effect or a displacing effect on government health financing. These different mechanisms of influence may result in changes in the balance between different health financing sources – government health financing from taxes, health insurance premiums, and out-or-pocket payments – which in turn has implications for the degree of equity of domestic health financing contributions. This figure is an original visualisation based on previous work by (35-37), and on the interview, document and quantitative findings of our study in Senegal. The arrows reflect our findings in Senegal

We developed the framework iteratively, both inductively and deductively. We first conducted a literature review to identify existing policy influence analysis frameworks from the broader policy analysis literature, including health policy analysis frameworks. Existing frameworks have focused on e.g. the nature of problems, politics and policy (38); context, policy content, policy process, and actors (39); policymaking processes (20, 40); agents of policy change (41); or on the ideas, institutions and interests underlying policy influence and reform (42-44). Others have emphasized political context, existing evidence and links/network factors, (35, 45, 46); mechanisms of policy influence more broadly (35, 36, 47); and the role of international science and finance in determining LMIC policy (37). A framework developed by Sparkes et al. for analysing the political economy of health financing reform has focused on the different dimensions of politics e.g. bureaucratic politics, leadership politics or external politics (15). Fox and Reich (2015) have combined Hall's 3-i's framework (42) and Kingdon's stream model (38)

to analyse how politics affects UHC reform in LMICs at different stages of the policy cycle (48, 49).

Three of the identified frameworks were found to emphasize policy influence mechanisms (35-37). These were adapted and adjusted into one that reflected the dimensions of EDP influence present in our data. We then applied the framework to our data, making any final adjustments needed based on the findings in the data.

We found that development partners can exert influence on domestic health financing contributions via setting aims and standards, providing policy/technical advice, lobbying and negotiating, and by providing finance. Development partner financing may elicit or require co-financing by the recipient government or displace government funds (fungibility/subsidy). These different modes of influence may result in changes in the balance between different health financing sources which in turn affect the degree of equity of domestic health financing contributions (3, 5, 10, 11).

The influence mechanisms via giving policy advice or technical advice, and by lobbying and negotiating, are derived from (35) and (36). Policy and technical advice can be viewed as evidence-based knowledge production and dissemination, often enacted through publishing official reports and briefings, allowing for the "*diffusion of sector-specific know-how*" offering solutions to policy problems (35, 36, 50). Lobbying/negotiating can be thought of as the art of persuasion, often involving high-level networking through people-to-people interactions in both formal as well as informal settings (35, 51).

The mechanism of providing external health financing is derived from (37). Based on our study results, we have added the policy influence mechanism: "setting aims and standards", meaning influence through the establishment of aspirational concepts such as the Sustainable Development Goals or (evidence-based) best practice recommendations; and we have further separated external financing into that which has an increasing or a displacing effect on domestic government health financing.

7.4.3. Study setting

Senegal is a Francophone democratic republic in West Africa with a population of 18 million (2023) (52). Classified as a lower middle-income country, its GDP per capita was $1,599 in 2022 (53).

7.4.3.1. Overview of health financing sources in Senegal

Over the past two decades, domestic health financing in Senegal has been characterized by a strong reliance on user contributions and a smaller and decreasing reliance on government contributions, with the exception of the year 2020 when government health financing saw a transient increase due to the Covid-19 outbreak (Figures Figure 7.2 and Figure 7.3). Following a period of steady rise from 2000-2006, GHE-S was $290 million in 2006 and $280 million in 2019 (constant 2022 US$) (Figure 7.2) (13, 53). This corresponds to a per capita decrease from $26 in 2006 to $18 in 2019 (constant 2022 US$) (13, 53), and a decrease per GDP from 1.8% in 2006 to 1.1% in 2019 (13) (Figure 7.2). Before the Covid-19 pandemic, GHE-S also received decreasing budget priority, declining as a share of General Government Expenditure (GGE) from 8% in 2006 to 4% in 2019, getting further from the Abuja target of 15% (13) (Figure 7.2).

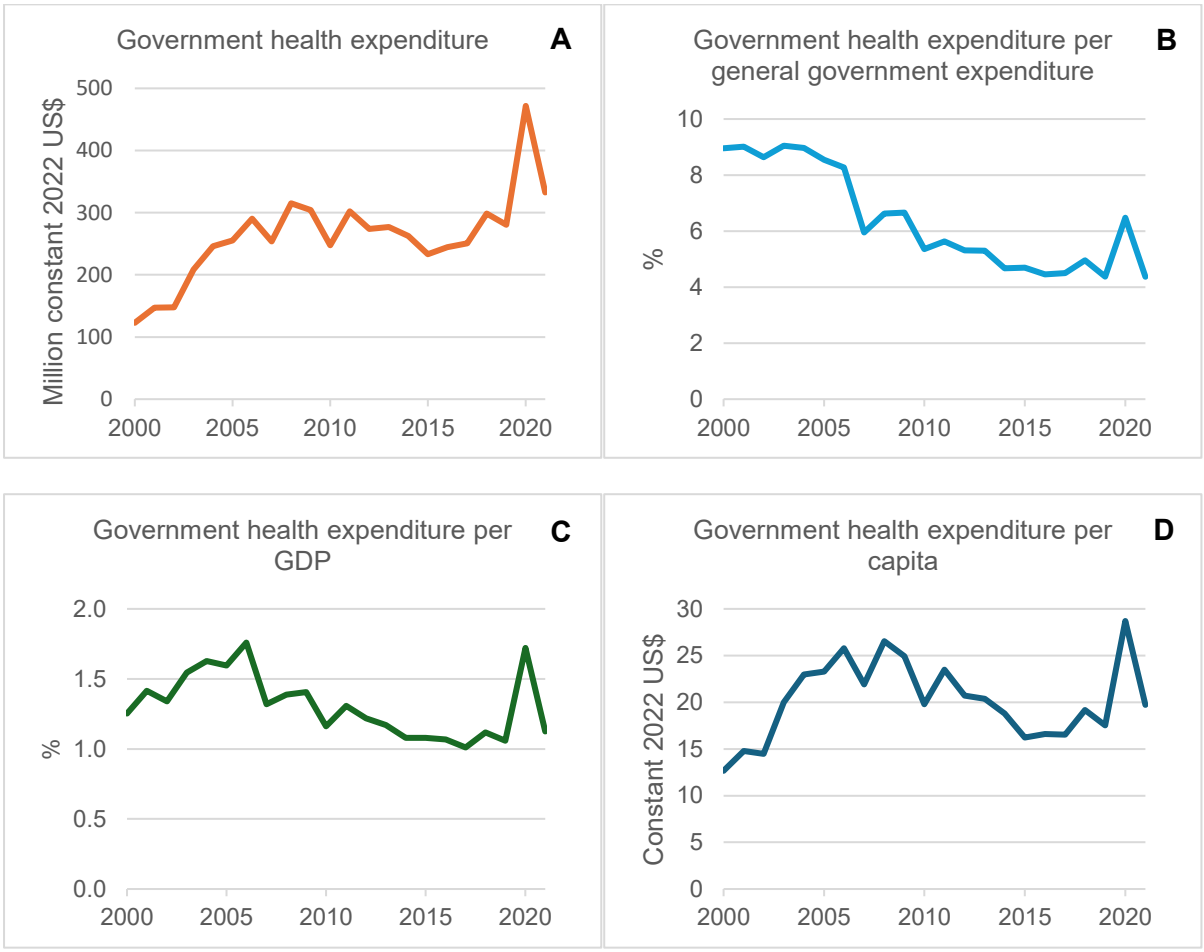


Figure 7.2: Government health expenditure from domestic revenue in absolute terms (panel A); as a proportion of general government expenditure (panel B); as a proportion of Gross Domestic Product (GDP) (panel C); and per capita (panel D) (13, 53). (Constant US$ data deflated using WB US$ GDP deflator data (53)).

Following a period of relative decline from 2004-2006, OOP contributions correspondingly made up a growing proportion of all health financing in Senegal, from their lowest point in 2006

at 37% to reach 49% in 2019 (Figure 7.3) (13). This corresponds to a per capita increase from $21 in 2006 to $36 in 2019 (constant 2022 US$) (13, 53).

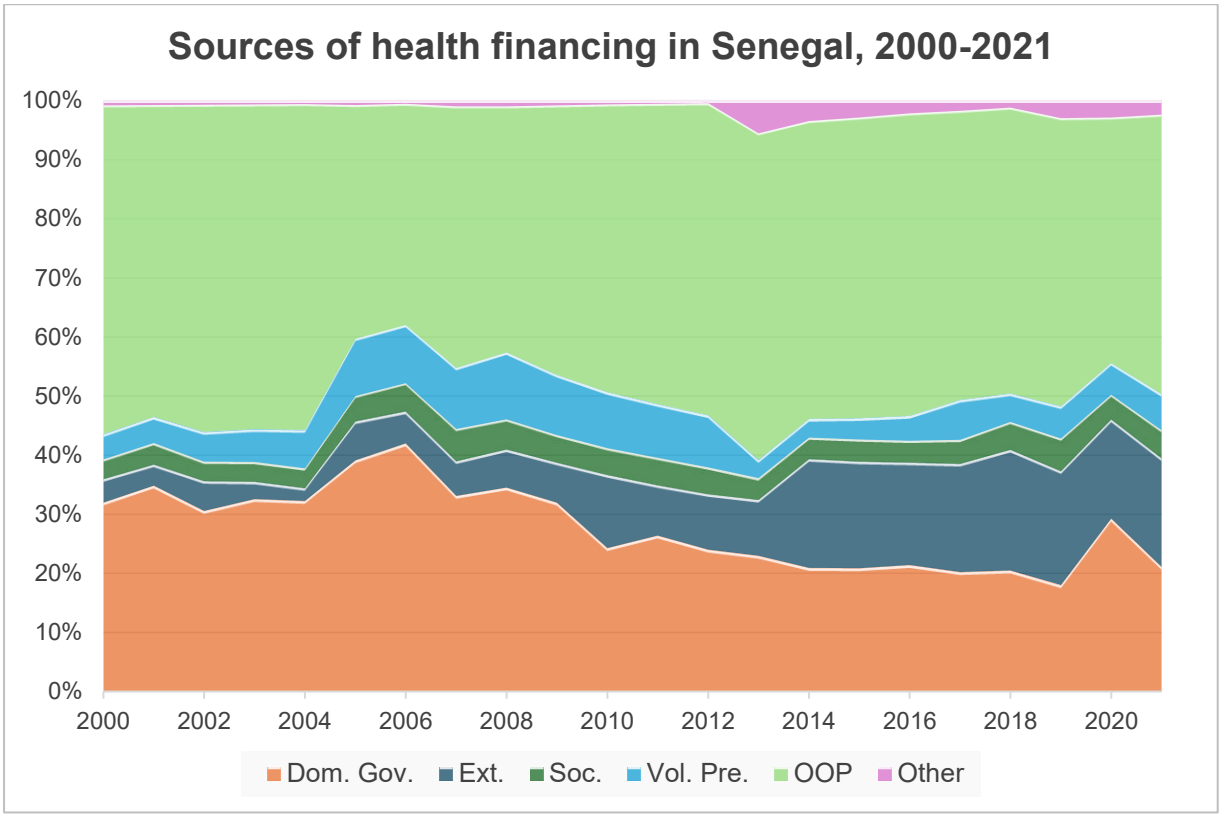
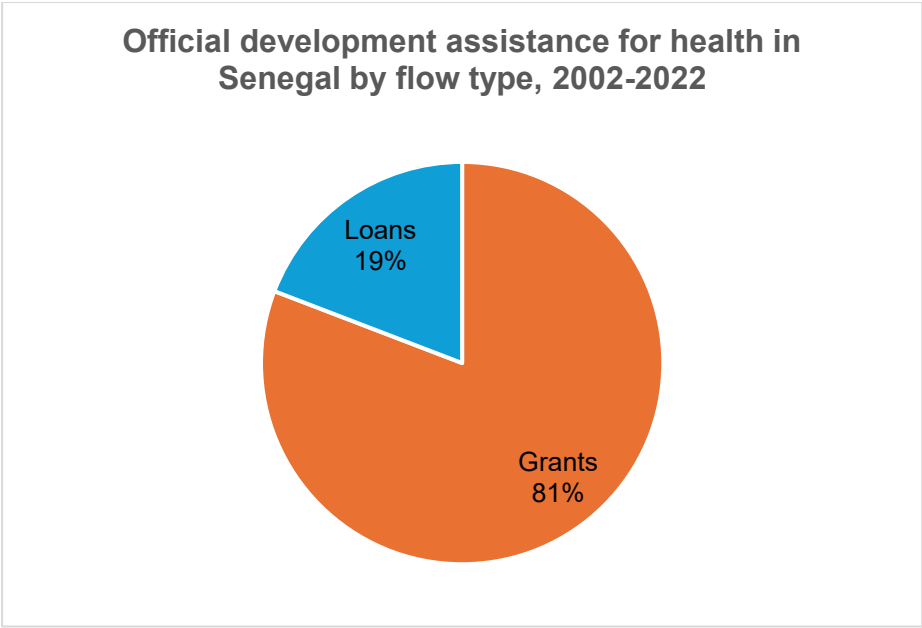


Figure 7.3: Sources of health financing in Senegal as percent of current health expenditure, 2000-2021 (13). Dom. Gov: Domestic government revenue; Ext: External financing; Soc: Social insurance contributions; Vol. Pre: Voluntary prepayment; OOP: Out-Of-Pocket Payments. Visualisation method as per (13). Note: There may be some additional government health financing captured within Soc. and Vol. Pre. as subsidies to these schemes.

Partly mitigating the previous lack of growth in domestic government health financing, real-term external health financing has expanded substantially from $14 million in 2000 to $236 million in 2021 (constant 2022 US$) (13, 53). This corresponds to an increase from 4% to 18% of Current Health Expenditure (CHE) over the same time period (Figure 7.3), or from $1 to $14 per capita (constant 2022 US$) (13, 53).

As seen in Figure 7.4, total Official Development Assistance (ODA) for health disbursed between 2002-2022 has been provided predominantly as grants (81%) and as project-type interventions (70%) (54).



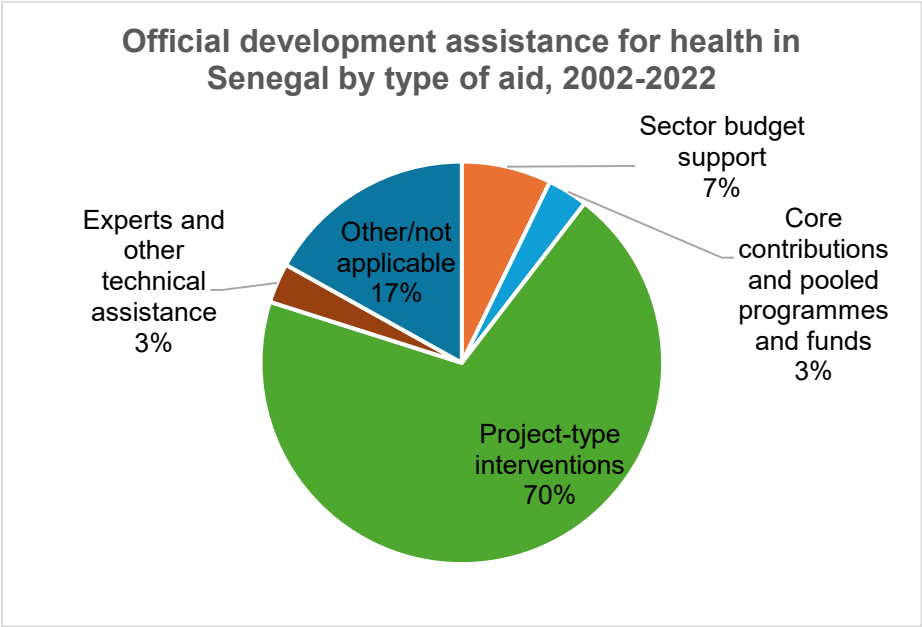


Figure 7.4: Total official development assistance for health in Senegal disbursed between 2002-2022, separated by flow types and types of aid (OECD, 2024).

7.4.3.2. Health financing schemes

Various health financing schemes exist in Senegal, as summarised in Table 7.1. The current composition of health financing schemes in Senegal is strongly influenced by the 2014 "*Plan Sénégal Émergent*" ("Emerging Senegal") that charted a course for all sectors including health sectoral reform (55). Currently, it mainly consists of a set of exemption schemes for vulnerable groups, priority services and drugs called the *Gratuités*; compulsory health insurance schemes for formal sector workers and their families; and CBHI schemes called the *Mutuelles* for all Senegalese though mainly targeting informal sector workers and the rural poor (56-63).

Scheme type	Scheme name	Target groups	Funding source	Pooling
Exemptions	*Gratuités*	People > 60 years, children < 5 years, caesarean sections, dialysis, antiretroviral and tuberculosis drugs	Government contributions, donor contributions	National level
Compulsory health insurance	*Assurance Maladie Obligatoire (Imputation budgetaire, Institutions de Prévoyance Maladie, and more)*	Civil servants + families, formal sector employees + families, retired state and private sector employees + families, university students, occupational injury and illness coverage and more	Member contributions, employer/organisation contributions, private donations	Scheme members
Community based health insurance	*Mutuelles de santé*	All Senegalese, though mainly informal sector workers, rural poor	Member contributions, state contributions*, private donations	Members, community level*
Private health insurance	Various	Anyone, though mainly wealthier groups	Member contributions	Scheme members

*Table 7.1: Overview of health financing schemes in Senegal (56-63). *For most of those enrolled in Mutuelles, the state pays 50% of the nationally fixed annual premium of 7000 CFA per person (62, 63) (approximately US$12), while certain very poor or disabled groups can obtain 100% subsidy (57, 59, 62). Mutuelles are currently undergoing consolidation from the community to the departmental level (21, 22, 63).*

7.4.4. Study design, sampling, data collection and management

This study was a qualitative case study comprised of key stakeholder interviews and a purposive document review, supplemented by descriptive quantitative analysis of health financing in Senegal. Interviews were conducted in Senegal between October 2019 and January 2020. Documents and quantitative data were collected before, during and after this period, and analysed after an initial analysis of interviews.

7.4.5. Purposive document review

To further investigate EDP influence on domestic health financing sources, we searched government and development partner websites for webpage articles and official reports on health financing and health financing policy in Senegal. This was done by screening websites from 11 EDPs and the Senegalese government for available links and references that could potentially discuss health financing (e.g. “Our work” => “global health”) (Figure 7.5).

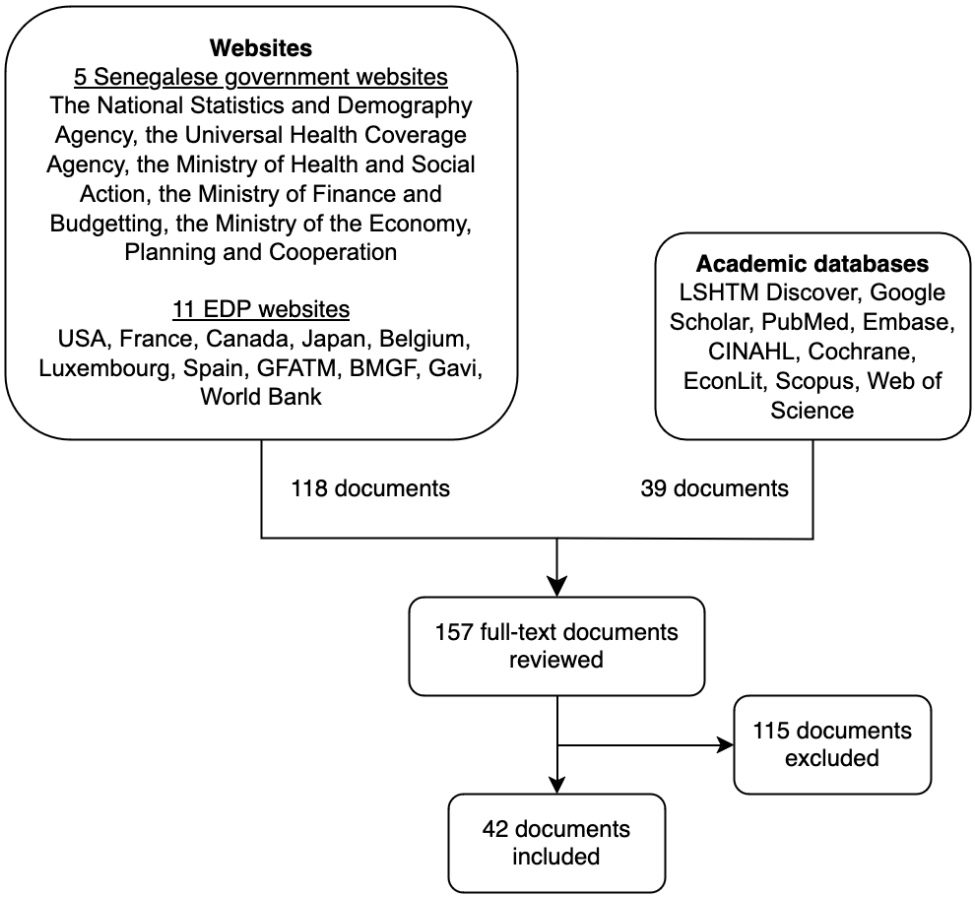


Figure 7.5: Flowchart for purposive document review. EDP: External Development Partner. GFATM: Global Fund to fight Aids, Tuberculosis and Malaria. BMGF: Bill and Melinda Gates Foundation. LSHTM: London School of Tropical Medicine & Hygiene. CINAHL: Cumulative Index to Nursing and Allied Health Literature.

Websites from the following organisations were screened: the Senegalese government (the National Statistics and Demography Agency, the Universal Health Coverage Agency, the Ministry of Health and Social Action, the Ministry of Finance and Budgeting, the Ministry of the Economy, Planning and Cooperation), the major bilateral and multilateral donors present in Senegal (USA, France, Canada, Japan, Belgium, Luxembourg, Spain, the Global Fund to Fight Aids, Tuberculosis and Malaria (GFATM), Bill and Melinda Gates Foundation (BMGF) and Gavi) (54) (Figure 7.6), as well as the World Bank.

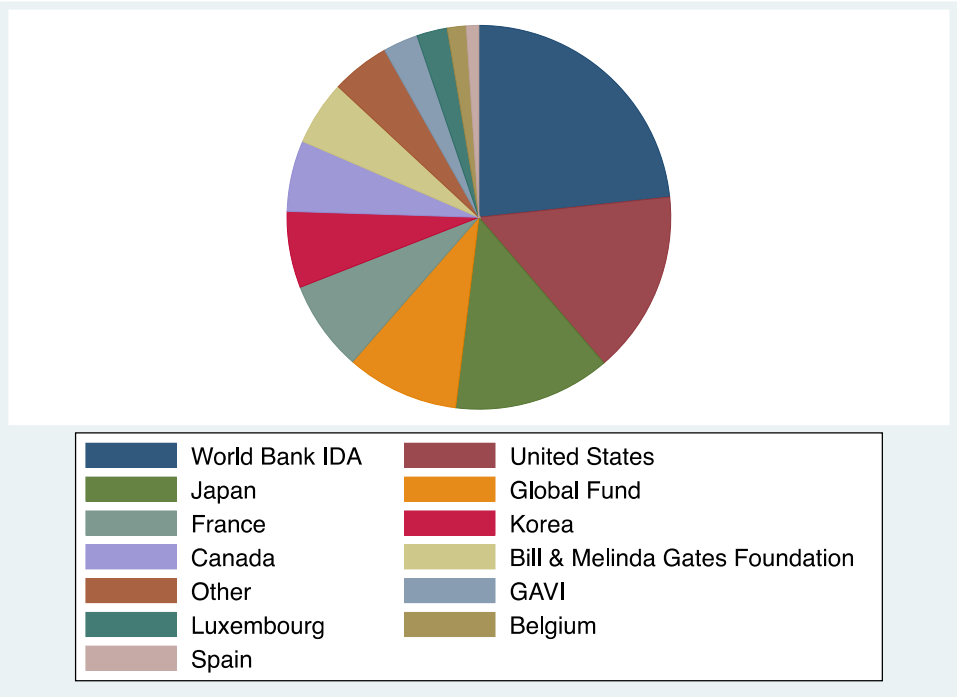


Figure 7.6: Main official development partners in the health sector in Senegal by disbursements made in 2022 (54). "Other" sums disbursements from 28 multilateral organisations, bilateral organisations and private foundations, each less than $3 million.

We also searched Google Scholar, PubMed, Embase, Cochrane, CINAHL, Scopus, Web of Science and EconLit for relevant academic literature, using keywords including Senegal, health financing and equity. 157 full-text articles and reports were retrieved for full-text review (118 from organisation websites and 39 via academic databases). Articles/reports documenting development partner activities with direct implications for domestic health financing contributions or providing facts confirming/rebutting cited statements from interviews were included and integrated into the results section. 42 out of the 157 full-text documents reviewed were included in the results. No time period constraints were applied to the document review in order to also obtain a broader historical understanding of EDP activities and health financing policy in Senegal, however we focus our results on the period after 2000.

7.4.6. Semi-structured interviews

We conducted an initial mapping of key external and domestic stakeholders engaged in health financing in Senegal by searching websites and through discussion with contacts in academia and government. Representatives from the main international official donors, government ministries and agencies, Senegalese civil society organisation leaders and academics, and management and administrative staff at the regional, district and hospital level were included. Once the initial set of stakeholder institutions and persons were identified, snowball sampling was used to identify additional participants (Table 7.2). We also included participants from the region of Tambacounda, as this region is the largest geographical region in the country with

an estimated population of nearly 1 million people in 2023 (65) and has one of the highest poverty rates in the country at 62% in 2018/19 (66). Repetition of similar observations and positions became apparent towards the end of interview data collection, indicating that data saturation was reached (67).

We conducted 32 interviews, 25 at the national level in Dakar and seven at the district and regional level in Tambacounda (Table 7.2). Representatives from two multilaterals, two hospitals, and two academics were unavailable/did not respond.

Stakeholder group	**Number of participants**		
	Total	*Dakar*	*Tambacounda*
Bilateral development partners	**4**	*4*	*0*
Multilateral development partners	**4**	*4*	*0*
Central government*	**9**	*9*	*0*
Regional/District government	**3**	*0*	*3*
Hospital management	**4**	*1*	*3*
Civil Society Organisations	**5**	*4*	*1*
Academics	**3**	*3*	*0*
Total interviews	**32**	*25*	*7*

*Table 7.2: Interview participants. *Central government participants came from four different ministries, however the specific ministries are intentionally not mentioned to protect the anonymity of participants.*

We used an interview topic guide to elicit the participant's organisation's activities, views/positions and observations relevant to the composition and degree of equity of health financing in Senegal and development partner influence hereon. Informed consent was obtained from all participants. Interviews were recorded where consent for this was given (n = 27). In the five instances where interviews were not recorded, FF took written notes and the interviews were used to broadly further his understanding of the research topic in Senegal and to inform the interviewees' general views on this. Interviews lasted from about 30 minutes to just over an hour. 30 interviews were conducted face-to-face and two remotely. Interviews were conducted in the preferred language of the participant. In most instances this was French and in some English. Interview materials were provided in the corresponding language. A professional interpreter was used for the majority of French-language interviews until FF had reached adequate proficiency for conducting interviews in French independently. Interviews were transcribed by a professional transcriptionist. FF controlled the quality and validity of transcripts by comparing segments from all interviews with the transcripts, including for all instances of inaudibility/lack of clarity. Interviews were analysed and interpreted in their

original language. Written notes were taken from all interviews. All interviews were treated as anonymous. The participant information sheets, informed consent forms and an example interview topic guide can be found in Appendix 5.

7.4.7. Interview data analysis

Interviews were analysed using the Framework method (68). We used NVivo for interview coding (69). We developed our coding framework based on a combination of deduction of pre-determined themes and induction of themes from the data. FF first coded a third of all interviews in an exploratory manner to establish themes (*n=11*), ensure conceptual clarity and avoid overlap or omission of themes present within the data (70). FF, JB and MMA then agreed on the final coding framework. An independent researcher then co-coded a transcript for validation, after which the final coding framework was applied to all transcripts. Summaries and central/illustrative quotations were entered into the framework matrix. The final dataset was then systematically reviewed for patterns and relevant opinions, factual statements and explanatory accounts.

7.4.8. Quantitative data

We used the WHO Global Health Expenditure Database (GHED) (13) to perform descriptive quantitative analysis of health financing sources (GHE-S, External Health Financing (EXT), OOP and Voluntary Health Insurance (VHI) (*Mutuelles*)). We looked at trends in the composition of health financing sources over time from 2000-2020 (all available data), to contextualise and triangulate information from our other sources.

7.5. Results

We identified partner influence on domestic health financing contributions via four mechanisms: setting aims and standards, lobbying/negotiation, providing policy/technical advice, and providing external financing (Figure 7.1). Our findings generally indicated an equity promoting role of development partners in regard to domestic contributions, however concerns were raised as to their actual effect as government health funding cuts had been observed.

7.5.1. Setting aims and standards

Commenting on the slow growth in government health spending seen in Senegal, seven out of eight development partner representatives interviewed stated that they wanted to see stronger increases in the government health budget, with several referring to the Abuja target of domestic government health expenditure making up at least 15% of GGE (71). This desire was echoed across all stakeholder groups, including Ministerial/government agency representatives.

"The country signs agreements, and in these agreements, it is asked to make a budget that is approved for health that must reach 15%. This is an external pressure, and the country is bound to make efforts to achieve this." (Ministry/government agency).

The Abuja declaration comes from African nations themselves (71), but donors used this as a normative standard towards which they wanted the Senegalese government to aspire. An internally derived aim thus became a partly externally promoted aim. However, over the period 2006-19, there was no discernible increase in real-term government health financing, while GHE-S/GGE decreased from about 8% to 4% (Figure 7.2). This indicates that this normative/aspirational influence pathway from both EDPs and African nations jointly has been ineffective in Senegal in this time period.

An academic also referred to the 1978 Alma Ata declaration (72) as another international standard used to promote UHC.

"We have now the universal health coverage, is it coming from Senegal? No Senegal has to implement it because we signed it. In 1978 when the world decided on primary health care, we signed it and we started implementing." (Academic)

Overall, there was mostly universal agreement between interviewee stakeholder groups, including donors, that Senegal should aim to reduce OOP. In terms of their overall policy stance, most donor representatives interviewed stated that they wanted the future development of Senegal's health sector to be characterized by higher government contributions and less reliance on OOP:

"[Donor] *encourages the countries to work on means to reduce user fees at service delivery points. Those are barriers in accessing health services and we very much support implementation of measures that facilitate access to health services by all populations, especially the poor population."* (Donor)

These positions follow the 2017 Senegalese national health financing strategy (73) and the 2019 National Plan for Health and Social Development (64), and are as such consistent with official government policy.

As elaborated below, an academic also highlighted the WB publication "Investing in Health" as influential on the Senegalese government in promoting primary health care financing, which indicates external aim/standard-, or norm-setting by the WB (74).

Development partner and government interviewees uniformly viewed Senegal as a nation with a high level of sovereignty and self-governance, setting its own targets and development partners getting behind those targets:

"In an organized country (Senegal), where there is a benchmark that serves as a reference, a partner cannot come and invest just anywhere… We are the ones who send funding requests to partners… The funding that is requested is always within the framework of what we want in terms of priorities." (Ministry/government agency)

Some interviewees in academia and civil society however disagreed with this view, arguing that donor funding priorities dictated government health program priorities:

"Each partner comes with their priorities, and the state in order to have the financing accepts everyone's priorities… Usually the priority is dictated by the funder." (CSO)

For this study, we did not identify any partner documents externally setting binding standards or aims for domestic health financing in Senegal, consistent with views expressed by government and donor representatives (64, 73).

7.5.2. Lobbying/negotiation and policy/technical advice

Statements of lobbying, negotiating or "pushing", as well as providing policy/technical advice for increased government health financing were given by some development partner representatives and academics. Policy/technical advice supporting UHC and CBHI was described in partner documents as well.

To help the ministry of health attain a higher budget and support its execution, a donor gave both technical and negotiation support as follows:

"What we are supporting is the planning process of the budget formulation. So, we are supporting the minister of health in the negotiation with the ministry of economy and finance … for additional resources in the health sector… We are also trying to support the execution of the budget … Training of some officials in the ministry of health about the procedures and the requirements of the budget execution." (Donor)

This suggests external support in internal negotiations to mobilize more government funds for health, thus having dimensions both of technical advice and negotiation. Referring to UHC, an academic described technical advice received from the WHO:

"Senegal cannot really isolate itself and say no I'm not listening to the world experts … You decide on the basis of advice that the international donors are advising. The technical guidance should be all of us, should be behind WHO whose mandate is to orient, guide and support our countries." (Academic)

They also described the World Bank "pushing" the Senegalese government to view health spending as an investment:

"In 2004 (original publication 1993), the World Bank published a document, that inspired our government which is Investing in Health… For the first time, the World Bank found

that investing in health has a return… It helped… When they said investing in health, they started pushing the government to invest more money in primary healthcare which was good." (Academic)

This relates both to aim/standard-setting as described above, but this was then described as followed by a "push" (categorised as lobbying/negotiation) by the World Bank toward the Senegalese government once this new aim had been established.

Partner websites and reports listed several examples of working to expand domestic health financing contributions by strengthening CBHI as described below. We categorise these as policy/technical advice. USAID and UNICEF were helping the Senegalese government develop and implement their national health financing strategy to expand UHC and *Mutuelles* (75-77). World Bank support for the *Couverture Maladie Universelle* and *Mutuelles* included technical advice, e.g. "*supporting new institutional arrangement to promote greater efficiency in internal processes of the UHI* ["*Couverture Maladie Universelle*" or UHC] scheme" (78, 79). The GFF provided "*technical support on developing a Theory of Change to further inform implementation of the Investment Case*…", which includes consolidation of *Mutuelle* risk pools (80).

7.5.3. Financing

Providing health financing was identified as a key way development partners sought to influence domestic health financing contributions. These findings generally illustrated development partners seeking to increase government health financing and expand and consolidate CBHI. This can be seen as equity enhancing by better aligning payments with ability to pay in the case of increased government health financing, and to some degree for *Mutuelles* given that 50-100% of premiums are paid for by the state. It also shows attempts to consolidate health insurance pooling at the departmental level, which increases financial risk sharing and cross-subsidisation, although with disagreement between partners along the way (21, 81).

USAID, AFD and the World Bank provided external support for the rollout of *Mutuelles* across the country during the past decade (79, 82-85). Using a mix of loans and grants, the World Bank together with multiple donors gave financial support to the Senegalese government for strengthening the *Couverture Maladie Universelle* programme including the *Mutuelles* (78, 79). This illustrates external financial support for strengthening domestic health financing schemes. Since 2014, there has however apparently been initial disagreement between partners about the need for consolidation of *Mutuelles,* with Enabel (Belgium) for and USAID and WB against (21, 81, 86). Informed by USAID-, WB- and Enabel-supported pilots of funding

pool consolidation, the Senegalese government has begun moving financial risk pooling from the community level to the departmental level (21, 22, 63). External financing has thereby indirectly led to a consolidation of funding pools, which is equity enhancing. In 2019, the Global Financing Facility (GFF) partnership, consisting of France (AFD), Gavi, GFATM, GFF, Japan (JICA), World Bank, USAID, UNICEF and other UN agencies, provided a $140 million loan and $10 million grant to support "…*the government's commitment to increase the share of its health budget from 4 percent* (of total government expenditure) to 10 percent by 2022" (80) (this number was 4% in 2019 and 6% in 2020 (13) (Figure 7.2)), extending Mutuelle insurance premium exemption for the poorest members and aggregating *Mutuelle* pools at the departmental level. This shows external financial support for expansion of government health financing and CBHI.

7.5.3.1. Co-financing vs. fungibility

In spite of the above investments, some interviewees did, however, call into question whether financial support from development partners stimulated an increase in government health spending (co-financing) or a decrease (subsidy / fungibility) (Figure 7.1).

7.5.3.1.1. Co-financing

We found examples of donors leveraging government finance include GFATM, Gavi and UNFPA which have government co-financing requirements for their health programs (87, 88). A donor explained:

"*[Donor] provides resources and the government has to provide also the cost share … The conditionalities are that you have to put at minimum 25% of the total envelope [Donor] is providing you*" (Donor).

Another example was the provision of $154 million from the WB to help co-finance the Senegalese government's Covid-19 response in 2021 (89), during which a great increase in domestic government health financing was seen (Figure 7.2).

7.5.3.1.2. Fungibility

Several of our interviewees claimed that development partner financing however led to decreases in government health spending, i.e. fungibility. Some government officials denied the presence of fungibility, while others believed it took place.

"Most of the time, when donors intervene, we are asked to give counterparts [i.e. co-financing]*, and we try to satisfy these counterparts. Without taking into account that we have to readjust… Especially when it comes to budget support, fungibility exists when it comes to budget support."* (Ministry/government agency).

A donor representative described cuts to the health budget during the government fiscal year as an explanation for why government health spending has not increased much in Senegal, and the interviewee attributed these cuts to a high presence of donors in the health sector:

"... What they [the government] *did during the development of the budget at the beginning of the fiscal year, so they give the amount… At the middle of the year, they introduced what they call the amending finance law … And they cut the budget … In the health sector… Because there are more donors in the health sector. So that means that the donor resource funding influences the decision of the government in reducing the budget... If they cut the budget, the first target population who will be impacted is the poor and vulnerable population."* (Donor)

Of the 15 years where amending finance laws were available since 2000, the government expenditure budget for the Ministry of Health (MoH) was cut eight times compared to six times for the Ministry of Education (MoE) (90)[26]. On average, the MoH lost 0.3% of its initial budgets through these amendments while the MoE gained 0.6% (90). Some expenditure for health and education however exists outside of these ministries. Furthermore, internal versus external revenue source for a given ministry's spending is not delineated in these documents. These numbers also do not elucidate the drivers behind budget cuts, and whether the presence of donors plays a role as claimed is thus not possible to verify using our other data sources.

Another government official emphasized a positive effect of within-sector fungibility of development partner financing for health by freeing up government resources for other social/health purposes:

"… Where partners put in a lot of resources, for example when we speak of certain priority diseases, we see that the state puts less resources… They indirectly influence domestic financing by permitting the state to put many more resources into neglected aspects" (mentions social protection and NCDs) (Ministry/government agency).

While these key-informant statements did not provide hard evidence for the presence of fungibility, which can be difficult to assert, they elicited fungibility as a potential mechanism constraining domestic government health financing. Figure 7.7 displays real-term absolute levels and year-on-year changes in government spending for sectors with available data and external health financing between 2000-2021 (13, 53). As illustrated, these time series do not allow for any judgment regarding the presence or absence of fungibility in the health sector, underlining the importance of key-informant observations.

[26] This citation covers 23 budget documents available via the link provided in the reference.

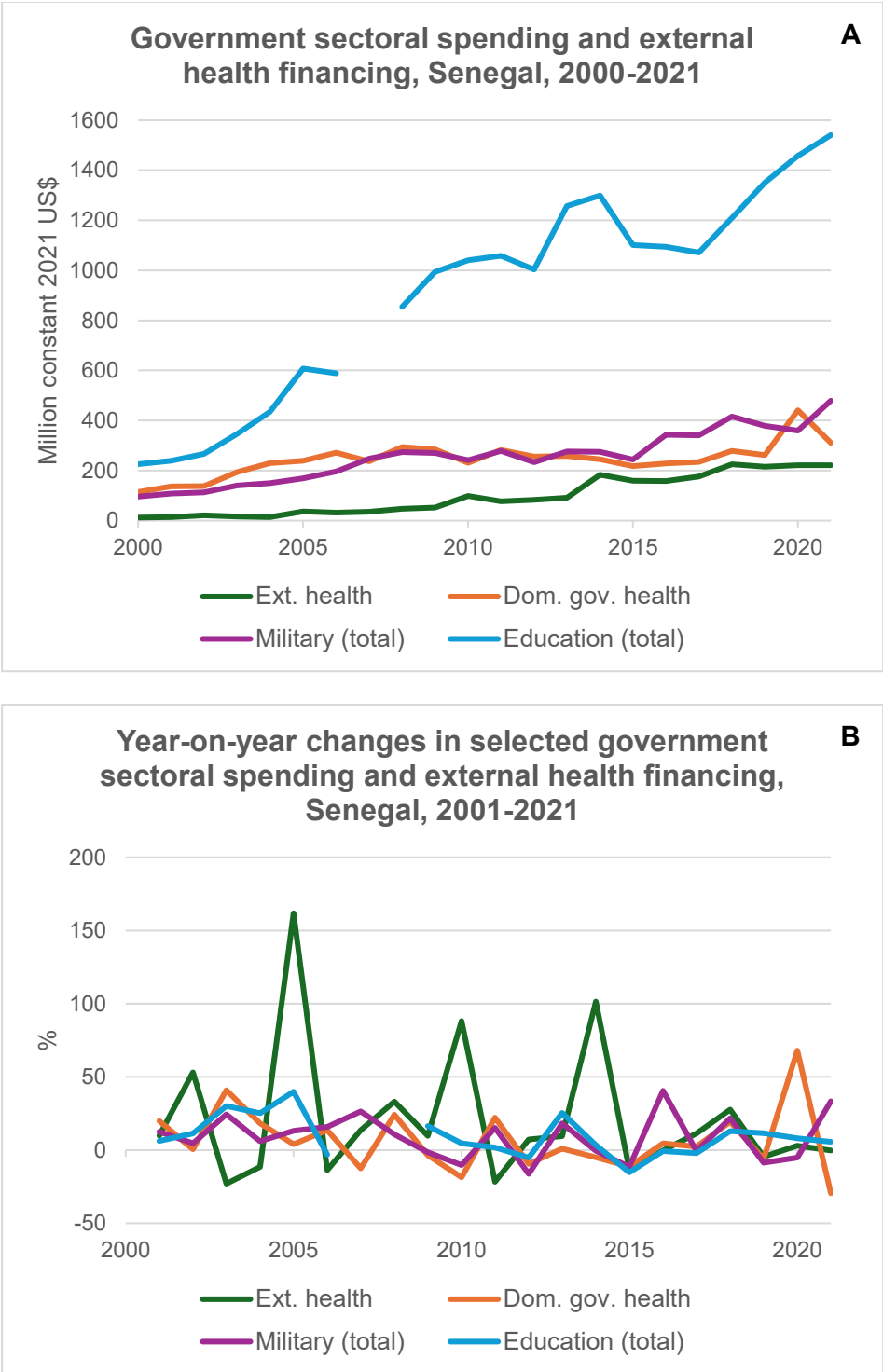


Figure 7.7: A: Government spending for sectors with available data and external health financing in Senegal, 2000-2021 (13, 53) (US$ GDP deflator used to transform current to constant US$ for all 4 categories, which leads to slightly lower health financing values than deflated WHO GHED values). B: Real-term year-on-year changes in government spending for sectors with available data and external health financing in Senegal, 2001-2021 (based on constant 2021 US$) (13, 53).

7.6. Discussion

The main objective of this study was to examine the pathways through which development partners influence the mix of domestic funding sources for health in Senegal. Our analysis

identified four potential pathways of influence: setting aims and standards, lobbying/negotiation, providing policy/technical advice, and financing (Figure 7.1). The influence identified generally appeared to be equity enhancing, mainly in terms of expanding government health financing, supporting existing insurance mechanisms and promoting an increase in the size of insurance scheme risk pools. Development assistance fungibility was however identified by some key informants as a dynamic potentially dampening the level of domestic government health financing. Some of the identified pathways of development partner influence were similar to those reported in studies exploring broader EDP influence on recipient governments, including on health and health financing policy. Within gender equality promotion and migration control in Senegal, (91) found consultants and people-to-people exchanges similar to our lobbying/negotiation and policy/technical advice which tend to occur through such interactions. (91) found infrequent presence of tied aid and no evidence of aid conditionality and attributed this to alignment between donor and government objectives. This resonates well with our finding that Senegal was generally seen to set its own development objectives and that partners aligned with these. Technical expertise and financing/financial incentives are frequently cited EDP modes of influence on health policy in other contexts, e.g. in Tanzania (92), Uganda (93, 94), Pakistan and Cambodia (95), and for health financing reform e.g. in Ghana (96), Nigeria (18, 97), Pakistan (98) and Thailand (99). Lobbying has been conceptualised as a general mode of influence in the politial economy of UHC reform in LMICs (48), which our findings support in the case of EDPs in Senegal.

Some authors have emphasized normative power and the diffusion/transfer of international norms (e.g. (100, 101)), by some described as rooted in neoliberal ideals in the 1990's and enacted by the international financial institutions, and how this promoted marketization of health systems and limited government health spending in partner countries (e.g. (102)). This dimension was reflected in our aims and standards category. In Senegal, other authors have found that the use of CBHI as the primary instrument in the path toward UHC, was influenced by a coalition of national and international actors, in part shaped by the ideas, institutions and interests of EDPs (86, 103). On the allocation side of health financing, EDPs have been found to act as "diffusion entrepreneurs", inducing diffusion of performance-based financing policy across SSA (104-106). As further confirmed by other authors (17-22, 24, 25), the role of EDPs in shaping health financing policy in SSA both across contributions and allocations appears well supported, with our study shedding further light on influence mechanisms for health financing contributions. Some authors have also used the case of the international response against HIV, tuberculosis and malaria in the 1990's and 2000's as examples of homogenous, vertical approaches in a heterogenous Africa, with associated marginalisation of African states (e.g. (24, 108)). Fred Eboko (108) saw hope for a return to agency, which we saw manifested

across our interviews in Senegal, and signs of successful government ownership have been found in health financing policy reform across SSA, including for user fees exemption policies (20). Future research could extend our findings and investigate the differential responsiveness to and integration of the different pathways identified on the part of recipient governments.

Our results did not provide examples of EDPs using public advocacy as a means of influence (35, 36). This is consistent with EDP influence occurring more in direct exchange with the Senegalese government, rather than via advocating publicly. This may reflect a functional and intricate collaboration between the Senegalese government and its external partners, where appealing to the government indirectly is unnecessary for EDPs.

For the health sector, our findings illustrate how it is important for development partners to consider to what extent all of their technical, political, and financial activities support partner governments in progressing towards improved equity of domestic health financing contributions and achieving UHC. There may be inconsistencies, where one branch of activities supports the government in mobilising more funds for health, while another helps expand user-fee contributions or regressive insurance premiums. The identified health financing policy analysis frameworks do not specifically emphasize mechanisms or pathways of EDP policy influence, while the identified broader policy influence analysis frameworks focusing on mechanisms/pathways stem from the broader development space without specific application to health financing policy reform (15, 20, 35-49). Our analytical framework fills this gap in the literature by focusing on the different pathways or mechanisms of EDP influence on different health financing sources. In doing so, the derived framework may help understand how the different main EDP activities pursue certain directions in the mix of domestic health financing sources. This may facilitate identification of areas of EDP policy incoherence on the path towards UHC. Once identified, this could form the basis for constructive discussion between government and EDP on how to address or minimise these. Due to a relatively high degree of sovereignty, political vision and quality of policy formulation, we generally saw a high degree of donor alignment and thus analysed EDP influence jointly. This may however vary greatly across contexts. If applying our framework individually across multiple EDPs in a country (e.g. first the World Bank, then the WHO, etc.), this would allow the analyst to map out health financing policy incoherence, separated by EDP and by mechanism. This could potentially add a degree of nuance that could further the utility of our framework as a diagnostic tool for EDP health financing policy incoherence, helping to identify which branches of activities in which organisations promote reliance on which health financing sources. Next steps for further developing our analytical framework could be to integrate co-determinants arising from the domestic political economy, which would require new dedicated empirical

enquiry. It is also conceivable that some pathways might be present in some countries but not in others, necessitating corresponding amendments. The financing pathway could also be further exploded into loans and grants and investigate the downstream effects of debt repayments arising from loans. Another avenue would be to integrate the "3-i's" (42) analogous to (48), exploring the underlying determinants for the EDP influence seen (see limitations).

In Senegal, development partners have provided their support of CBHI in the form of *Mutuelles*, however the *Mutuelles* have been critiqued. Issues have included relying on user co-payment, creating relatively small pools with variable financial sustainability, limiting cross subsidy from rich to poor and financial risk protection of poor members, and instituting voluntary enrolment with limited reach (21, 62, 63, 109-111). Efforts to consolidate *Mutuelles* at the departmental level are ongoing (21, 111), which however does not raise risk pooling to the national level (63, 81). Arguments for the decentralized CBHI model included management being rooted in communities with a higher degree of community ownership, and the historical presence of CBHI in Senegal, leading to higher social acceptability (86, 103). Arguments for a joint departmental model have included administrative professionalization, improved risk pooling, efficiency and financial viability (21, 86, 112). The proposed administrative centralization in the departmental model, enabling increased cross-subsidy among many more members, can be viewed as adhering more to a social welfarist ideology as opposed to the decentralized model, by some described as rooted in neoliberal ideology (81). This exemplifies how differences in priorities and ideologies between partners can cause conflict in the search for a preferred UHC strategy. The value of EDP-supported pilots of alternative health financing mechanisms before broader scale-up, including CBHI, has been noted in Cambodia (113), Ethiopia (114), and across LICs (115), but has also been critiqued as incoherent and ineffective in supporting health financing reform due to poor donor coordination and harmonization in Tajikistan (116). Viewed together, this highlights the importance of the principles of effective development cooperation from the Paris Declaration, Accra Agenda and Busan Partnership for successful EDP-supported health financing reform (115, 117, 118).

Several interviewees identified development assistance fungibility as a mechanism limiting government health spending. The fungibility dynamic in development assistance for health is a well described phenomenon (26, 27, 30, 31, 119-122), and while undesirable for donors, it has been viewed as rational redistribution of funds by others (123, 124). Most of the ODA for health since 2002 has been disbursed as project-type interventions (70%), which are more tightly ear-marked (125), and only 7% as sectoral budget support, which limits the scope for fungibility of the injected funds themselves. Crowding-out of government funds is however still

possible, if the government deems that externally funded projects cover certain population health needs and then decides, for whatever reason, to withdraw or not to supplement with funding for the same population health needs.

With the mentioned caveats of a possible fungibility effect and the small financial risk pools of decentralized CBHI, which is now being reformed, EDPs in Senegal generally appear to have been a force for improved equity of domestic health financing sources. They have used their identified influence pathways to promote a mix of domestic health financing sources characterized more by progressive, tax-based contributions from the government and less by OOP. In the complex political economy of UHC reform, the incrementalist approach building on existing CBHI structures may however have limited the overall scope for equity improvements compared to a more universalist approach (21, 48, 86). The enduring predominance of OOP in Senegal and limited real-term growth in GHE-S indicates that in spite of their efforts, EDPs have not been successful in achieving a more equitable domestic health financing mix. Differing interests from both different domestic stakeholders, including domestic policy makers and the Senegalese mutualist movement, as well as between different EDPs (USAID, Enabel and the WB), may have co-determined the limited progress seen over time (21, 81, 86).

7.6.1. Limitations

The dynamics we have investigated in this study result from policy processes that often occur behind closed doors and are subject to unspoken ideology, power dynamics and political considerations (100, 126-129). Interview participants may also have held incorrect or imprecise information, and causal pathways from external development partner actions to domestic health financing impacts may be complex. Also, there is no counterfactual, and it is not possible to truly know how domestic health financing would have differed in the absence of development partner influence. These circumstances inevitably limited the extent to which we could access the “truth” of our research question. We sought to mitigate this limitation by interviewing a broad range of stakeholders, offering them anonymity so they could speak freely, and using a range of other sources of information to triangulate statements. Future studies could search for natural policy experiments, possibly at the regional or district level, where comparable geographical entities are subjected to different EDP-supported health financing reforms, such as the Enabel-funded pilot of departmental aggregation of CBHI in Senegal. Such studies should however bear in mind the historical and present influence from other EDPs, and finding a true “untouched” control seems improbable.

We were also unable to measure actual equity of financing through financing incidence analysis, but rather sought to provide an indication of whether and how development partners influenced financing mechanisms that are typically more or less equitable.

Our results did not allow us to explore the underlying reasons for why development partners used a particular mechanism or tried to push health financing contributions in a certain direction. The *"3-i's"* framework by Hall 1997 (ideas, interests and institutions) is one possible basis for approaching this question (42-44), as exemplified by (48, 86, 130, 131). On the allocation side, neoliberal ideology has been pointed out as a reason for development partners promoting performance-based financing in Senegal (81). Future research should further interrogate the role of IFI policy recommendations and loan conditionalities in determining domestic health financing contributions and allocations in Senegal.

Certain nuances may have been lost in translation during interviews. To mitigate this, a professional interpreter was used for French-language interviews until this was no longer necessary. Interviews were also transcribed in their original language, so all nuances in wordings were retained in the data and could be interpreted post hoc. Where interviews were conducted in English as per the stated preference of the participant, this may still not have been their primary working language, and some depth and nuance may have been lost as a result.

While the manuscript was written in English, the proficiency of our team in both French and English and the use of a professional interpreter and transcriptionist should have rendered any impacts on our results and interpretation from French-English translation altogether minimal.

Five participants did not allow for the interview to be recorded or used directly in the paper, which greatly limited the analytical utility of these interviews. As an attempt to mitigate this effect, FF took notes from these interviews to help understand the interviewee's general position on interview topics, which helped inform the research, however superficially compared to recorded interviews. To honour the wishes of these participants and follow the lower level of detail present in handwritten interview notes, we only referred to findings from these interviews as part of broad statements such as "*X was echoed across all stakeholder groups*".

Representatives from two multilateral organisations, two hospitals and two academics were unavailable for interview or did not respond. Had these representatives participated, perhaps

our results might have been slightly less favourable for the government. However, as seen in Table 7.2, our final interview group was well balanced, with 9 interviewees in central government vs. 15 outside of the central government-donor nexus, and 12 of the latter were from hospitals, civil society and academia, which were generally more critical groups.

Finally, as our purposive document review was not a full systematic literature review, it is conceivable that we could have overlooked relevant studies.

7.7. Conclusions

We identified setting aims and standards, lobbying/negotiation, providing policy/technical advice and financing as avenues for development partner influence on domestic health financing contributions in Senegal, and with a seemingly equity enhancing influence. Fungibility and intrinsic equity issues related to CBHI may however have limited equity gains. We encourage stakeholders in the health financing sphere to use our framework and analysis to unpack how development partners affect domestic health financing, including equity, in other settings. This could serve as a basis for identifying dynamics that do not optimally support progress towards UHC, and facilitate working towards coherent policy-making across all domains of development partner activities, that all support UHC. Our framework and analysis should be expanded and amended in other contexts as appropriate. The role of international creditors, lending and loan conditionalities on domestic health financing in recipient countries should also be further explored, including equity implications.

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RESEARCH PAPER COVER SHEET

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SECTION A – Student Details

Student ID Number	lsh1601722	**Title**	Dr.
First Name(s)	Frederik		
Surname/Family Name	Federspiel		
Thesis Title	External Development Partner and International Monetary Fund Influence on Domestic Health Financing Sources in Low- and Middle-Income Countries: Panel Data Analysis and Case Study in Senegal		
Primary Supervisor	Josephine Borghi		

If the Research Paper has previously been published please complete Section B, if not please move to Section C.

SECTION B – Paper already published

Where was the work published?			
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SECTION C – Prepared for publication, but not yet published

Where is the work intended to be published?	Globalization and Health
Please list the paper's authors in the intended authorship order:	Frederik Federspiel, Josephine Borghi, Henning Tarp Jensen, Elhadji Mamadou Mbaye, Melisa Martinez Alvarez

Stage of publication	**Not yet submitted**

SECTION D – Multi-authored work

For multi-authored work, give full details of your role in the research included in the paper and in the preparation of the paper. (Attach a further sheet if necessary)	I designed this study as Principal Investigator (PI) in collaboration with my supervisors and co-PI in Senegal. I produced the study protocol and research ethics applications with input from supervisors and co-PI. I collected, analysed and interpreted the data, and wrote the first draft paper, with the input necessary along the way from my supervisors. My supervisors, local co-PI and I then critically revised the article, with me being responsible for performing the revisions necessary.

SECTION E

Student Signature	[redacted]
Date	20/9-2024

Supervisor Signature	[redacted]
Date	23/09/24

8. Chapter 8: Influence of Public External Borrowing on Domestic Health Financing Sources: A Case Study of Senegal

8.1. Chapter overview

Chapter 6 identified negative relationships at the global level between Official Development Assistance (ODA)$^{+}$ for health and Government Health Expenditure as a Source (GHE-S) and Out Of Pocket payments (OOP), and found Public and Publicly Guaranteed (PPG) external debt servicing to be associated with shifts from GHE-S toward OOP in the mix of domestic health financing sources. Chapter 7 further explored the ways in which External Development Partners (EDPs) could influence the mix of health financing sources using a case study of Senegal, also identifying a fungibility dynamic while establishing some further non-financial influence mechanisms. The present chapter expands on these findings by exploring external influence on domestic health financing sources in Senegal via the financial mechanism of providing loans resulting in debt obligations. As outlined in Chapters 1, 2 and 3, loans specifically provided by the IMF and WB are provided under programs with extensive macroeconomic and fiscal policy recommendations and conditionalities that may determine government health expenditure and the mix of domestic health financing sources in borrower countries. This chapter uses mixed-methods, including interviews, document review and descriptive quantitative analysis to address objective three of this thesis: To explore how external official lending, public external debt obligations and IMF/WB policy recommendations and loan conditionalities affect the mix of domestic health financing sources in Senegal. It begins with a summary of the relevant literature, introduces the analytical framework and the study setting and methods, before summarizing its findings. It then discusses these findings in relation to the literature before making some recommendations for policy and future research based on its findings.

8.2. Abstract

Background

Public external debt burdens of Low- and Middle-Income Countries (LMICs) have grown substantially over the past decade linked to increased borrowing. Our empirical understanding of the ways in which external official loans, their ensuing debt burden and associated policy recommendations and loan conditionalities may impact the mix of domestic health financing sources, is limited, particularly at the country level. We conducted a mixed-methods case study of Senegal focusing on the role of the International Monetary Fund (IMF) and the World Bank (WB) to better understand these dynamics.

Methods

We conducted semi-structured interviews between October 2019 and January 2020 with 25 key informants from government ministries, development partners, academia, civil society and hospital management in Senegal. We also performed a purposive document review of reports from IMF, WB, government websites and academic literature, as well as a descriptive quantitative analyses of loan, debt and health financing statistics.

Results

External official lending has had a mixed influence on the different domestic health financing sources in Senegal. Our findings indicated that this has occurred via the following pathways: Loans have helped expand the government budget and have supported the health sector directly. Resulting debt obligations appear to have had a constraining effect on the government budget including for health. Specifically for IMF/WB loans over the recent two decades, these have come with policy recommendations and conditionalities promoting increased domestic government health spending, expansion of community-based health insurance and private sector health service delivery, along with fiscal austerity.

Conclusions

To mitigate the negative effect of debt repayment, official external creditors should consider more flexible debt repayment timelines, exploring options for debt relief including debt-to-health swaps, and a specific government health expenditure floor at 10-15% of government expenditure. A legally binding agreement building on the Abuja pledge could be considered between the Senegalese government and its external partners to support sustained increases in government budget prioritisation of the health sector, supported by debt relief.

We encourage further country level research documenting debt impacts on health financing.

8.3. Introduction

In the late 1990's and early 2000's, the public external debt burdens of Low- and Middle-Income Countries (LMICs) were high. This was viewed as unsustainable, constricting fiscal space in turn limiting investments in social sectors. Debt relief was granted out of a motivation to help countries free up resources to develop and fund their hard-pressed education and health sectors (1, 2). This resulted in falling debt obligations during the 2000s (3-5) (Figure 8.1). The debt burdens of LMICs to foreign creditors have since been growing over the following decade, as debt relief decreased and public external borrowing increased (6). In 2021, 49 out of 116 LMICs with data spent more on public external debt servicing than on health compared to 34 in 2010 (7, 8), a trend concentrated among Sub-Saharan African (SSA) countries (7-10).

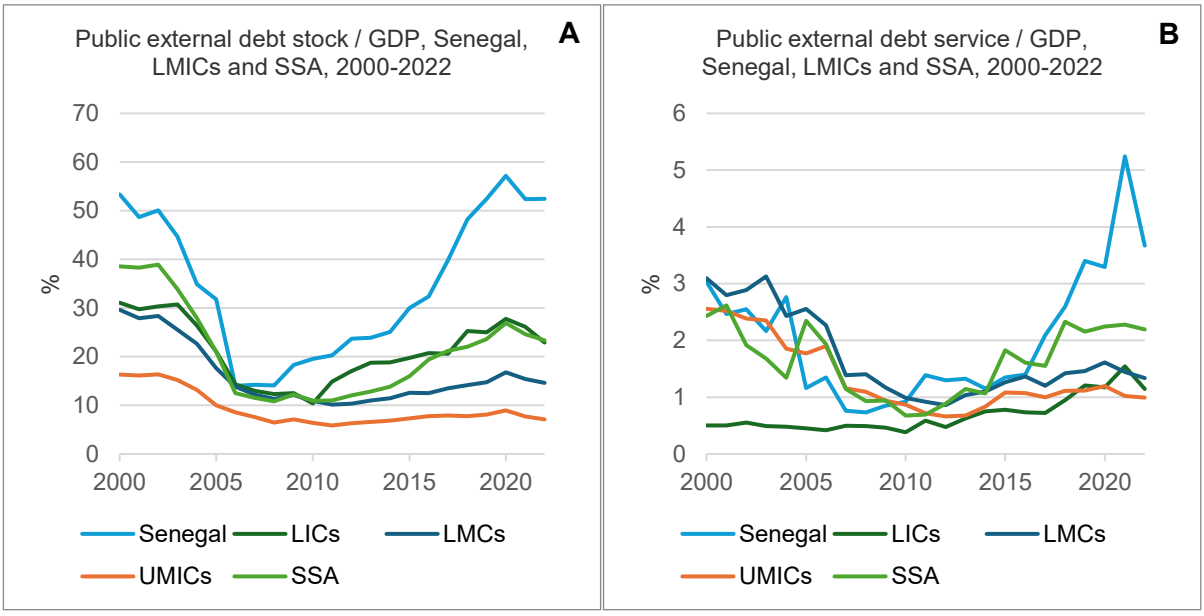

Figure 8.1: Public and Publicly Guaranteed (PPG) External debt stocks (panel A) and service (panel B) as fractions of Gross Domestic Product (GDP) in Senegal compared to Low- and Middle-Income Countries (LMICs) and Sub-Saharan Africa (SSA) (%), 2000-2022 (3). SSA grouping is with high income countries excluded. LICs: Low Income Countries. LMCs: Lower Middle-income Countries. UMICs: Upper Middle-Income Countries.

All loans provided by external official creditors have different terms of lending. Unlike other creditors, loans from the International Monetary Fund (IMF) and the World Bank (WB) are offered under programs with a range of macroeconomic and fiscal policy recommendations and conditionalities in addition to requirements for repayment. These have historically involved measures of fiscal consolidation, decentralization, privatization and trade liberalization, which can also affect domestic health financing.

Existing literature has examined the association between public external debt and government health spending through quantitative cross-country panel data analyses in African (11, 12),

Latin American (13), South- and Southeast Asian (14), and select “emerging” and middle-income countries (15) as well as across LMICs overall (16-18). A discussion report has examined trends in debt and government health spending in Kenya (19).

IMF/WB loan conditionalities were associated with the introduction of user fees for health services in the 1980’s and 1990’s across several Sub-Saharan African countries (20-24). Policy recommendations and conditionalities of austerity such as public spending cuts, containing the wage bill, and privatization of public entities from the IMF have been criticized for leading to constrained government health spending (12, 20, 25-35), including in Senegal (33). However, the IMF and WB have conversely claimed that government health spending is protected from austerity measures, and even increased in IMF Structural Adjustment Programme (SAP) countries compared to non-adjusting countries (36-40). Other researchers have reported findings that align with those of the IMF/WB across LMICs (41), SSA Low-Income Countries (LICs) though not for non-SSA LICs (42), and in Ghana (43). Only one of these studies has systematically investigated IMF policy documents in Senegal from a health sector perspective, briefly describing IMF documents for Senegal from 2004 and 2005 among data from 15 other SSA countries (25). We identified no studies systematically interrogating WB policy documents in Senegal from a health sector perspective.

The existing studies of both debt and loan conditionality impacts on government health spending consist primarily of quantitative, cross-sectional, multi-country analyses and desk-based document reviews. As such, they are limited in their ability to identify potential effect pathways and explain observed associations in the study countries.

While we explore effects of loans and ensuing debt from all external official creditors, we specifically focus on the role of IMF and WB policy recommendations and conditionalities in determining the mix of domestic health financing sources in Senegal. We focus on these two creditors because of their privileged and extensive role as the main global actors in macrofiscal policymaking historically across the Global South (44-46) and the reported influence on health financing (12, 20-22, 25-32, 34, 35) including in Senegal (33). These organisations have distinct mandates: IMF ensuring macroeconomic stability, and the WB promoting social and economic development (47-50). We therefore discuss their influence individually and comparatively as appropriate.

Our study aims to understand the influence of external official loans from External Development Partners (EDPs, including the WB) and the IMF, the ensuing debt obligations, and specifically the policy recommendations and loan conditionalities that come with IMF/WB

loans on the mix of domestic health financing sources, by performing an in-depth mixed-methods case study of Senegal.

8.4. Methods

8.4.1. Framework for mapping effect pathways

We developed a framework shown in Figure 8.2 of the potential pathways for how loans from external official creditors, the ensuing debt repayments and IMF/WB policy recommendations and loan conditionalities can affect the mix of domestic health financing sources. The framework was developed iteratively based on the available literature and economic theory, and our study findings. We used the derived general economic understanding as described below as the foundation for analysing and interpreting our data. For a glossary of the debt-related abbreviations used in this paper, see Table 10.3 (Appendix 6).

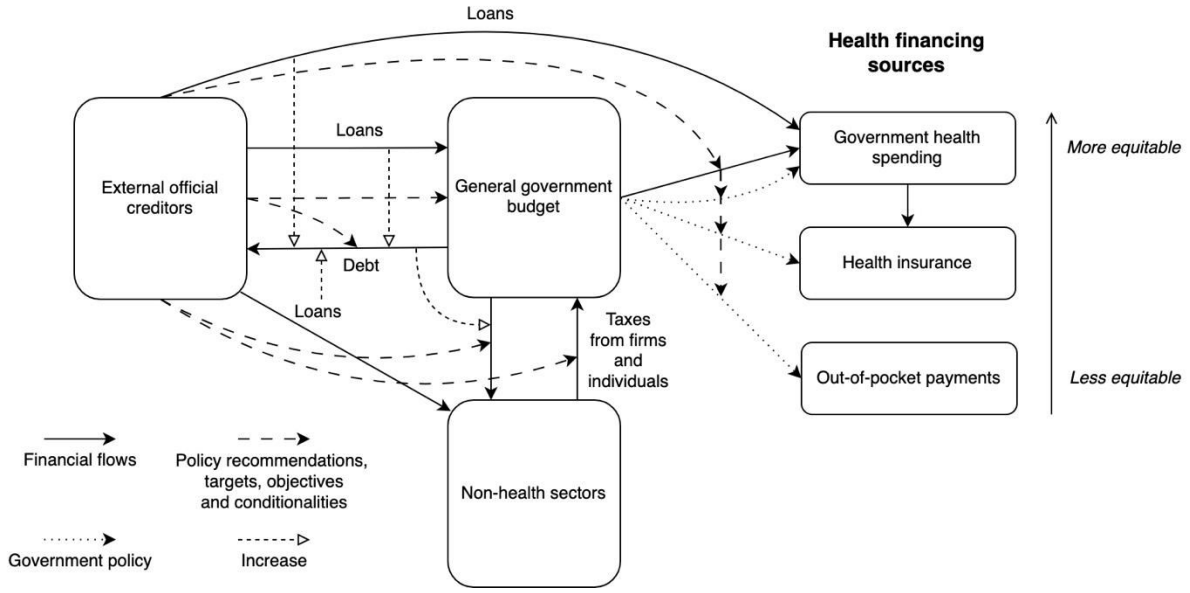

Figure 8.2: Framework illustrating how lending activities from external official creditors may affect government health spending, and how accompanying policy recommendations, targets, objectives and conditionalities may affect both central fiscal policy and health sectoral policy for the different sources of health financing.

External official creditors give loans to the recipient government as general budget support or earmarked funds to specific sectors, including the health sector. Over time, debt plus its interest accumulates and needs repayment from the general government budget. However, the government health expenditure budget is also determined by levels of Domestic Resource Mobilisation (DRM), development assistance, and political prioritisation. DRM relies in part on the amount of taxable economic activity, which is co-determined by external official lending that may help grow the economy. This results in a question of relative balance: Which sectors benefit more from development lending, and which sectors are “picking up the tab” for repaying

investments in other sectors? Importantly, the debt burden effects will depend on the terms of lending, and concessional loans will result in a lower debt servicing burden than non-concessional loans[27], all things equal.

External official loans also come with associated policy recommendations, targets and objectives, as well as binding and non-binding conditionalities. IMF policy advice and loan conditionalities generally pertain to the central and structural levels such as balance of payments, fiscal deficit, tax revenue, public financial management, etc. (52). These factors co-determine a government's ability to finance its different sectors, the balance between the public and private sector, and how the government will prioritise its resources to ensure it meets IMF requirements. WB policy advice and loan conditionalities may target the central and the sectoral level, including project-level advice (53), thereby affecting government policy at all system levels.

For the health sector, these factors may in combination help determine how much of the government budget is allocated to the health sector. A larger government health budget may be able to reach more people and cover more services, resulting in a lower degree of reliance on user fees and other private health financing mechanisms in the health system, and vice versa. If IMF/WB policy recommendations and conditionalities conversely expand the role of the private health sector, this might lead to a similar expansion of private health insurance and user fees to pay for private health services. Together, these factors may affect the balance between the main domestic health financing sources: government health spending from domestic revenue (Government Health Expenditure as a Source (GHE-S)), health insurance payments and Out-Of-Pocket payments (OOP). This balance may determine the overall degree of equity in the mix of domestic health financing sources by influencing to what extent funds are prepaid, pooled and contributed progressively in accordance with ability to pay, which in turn affects health service access for the poor and associated health outcomes (54-62).

8.4.2. Study setting

Situated in Francophone West Africa, Senegal has been one of the most stable democracies in the region, and in Africa more broadly (63), except for political turmoil that erupted over former President Macky Sall's attempt to postpone the 2024 presidential elections (64). The country became independent from French colonial rule in 1960 (63). In 2023, the country had

[27] Concessionality depends on the grant element of a loan and is defined by the OECD DAC as a measure of credit softness reflecting "*the benefit to the borrower compared to a loan at market rate*" (51).

a population of approximately 18 million (65) and a GDP per capita of $1,599 in 2022 (3), resulting in a WB classification as a Lower Middle-income Country (LMC). We chose Senegal as a case country for four main reasons. A: Its political stability at the time of fieldwork, so our results were reflective of creditor-government dynamics under stable conditions. B: Its relatively low perceived corruption levels (2023 and earlier) to minimise the risk of changes in health financing occurring due to corruption and not the factors of interest to our study (66). C: A growing public external debt burden (3) (Figure 8.1 and Figure 8.4)[28]. D: A health financing composition increasingly characterized by user fees and less so by government contributions at the time our interviews were performed in 2019/20 (8) (Figure 8.3), inviting questions as to the determinants of this trend.

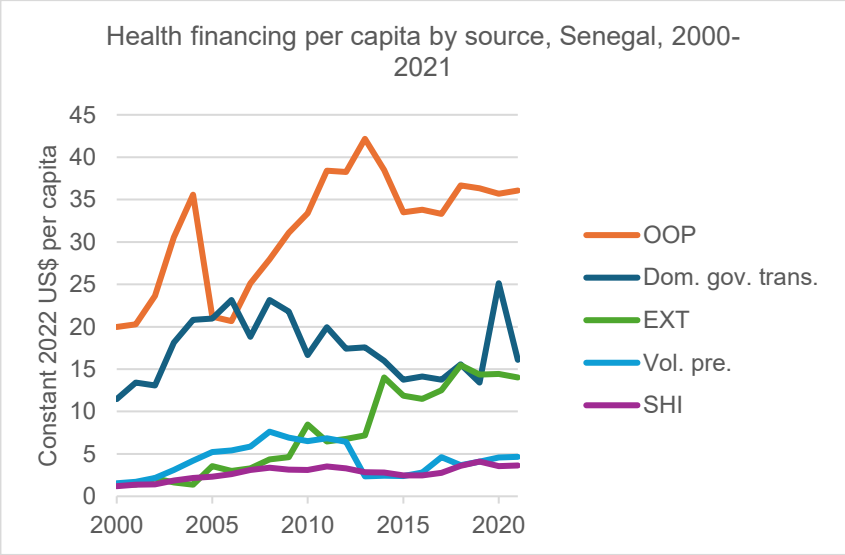

Figure 8.3: Health financing per capita by source in Senegal from 2000 to 2021 (constant 2022 US$) (3, 8). OOP: Out Of Pocket payments. Dom. gov. trans: Transfers from domestic government revenue allocated to health purposes. EXT: External health financing. Vol. pre: Voluntary prepayments. SHI: Social health insurance. Government subsidies to SHI are deducted from SHI figures.

8.4.3. Study design, data collection, management and analysis

This study was a mixed-methods case study comprised of a purposive document review, key stakeholder interviews together with descriptive statistical analysis of health financing contributions in Senegal. The document analysis and analysis of quantitative data was performed after the initial analysis of interview data, going back and forth between all sources of data while writing up the results.

[28] In 2017, the Senegalese government changed its definition of public debt to also include parastatals, state-owned enterprises and central government issued guarantees, resulting in an increase in public debt per GDP of about 11% (67).

We considered the following as evidence of external official lending, public external debt servicing, and the IMF/WB influencing domestic health financing sources. A: statements from interviewees identifying a such influence or effect. B: written documentation of IMF/WB policy recommendations, targets, objectives or conditionalities directly pertaining to domestic health financing sources. C: Discernible patterns between levels and changes in external official lending, public external debt servicing and domestic health financing sources.

8.4.3.1. Document review

We reviewed IMF (68, 69), WB (70) and Senegalese government websites (71-76) to identify key documents that contained information on external official borrowing, economic policy discussions, recommendations and loan conditionalities from the IMF and the WB (215 full text documents reviewed)[29]. We also used the London School of Hygiene & Tropical Medicine Discover platform and Google Scholar to search all academic publishing databases and collections, including PubMed, Embase, CINAHL, Cochrane, EconLit, Scopus and Web of Science, for academic literature mentioning external official lending, public external debt or loan-associated policy recommendations/conditionalities in Senegal[30], both health-specific and not. 8 academic articles were identified for full-text review. From the identified loan agreements, reports and articles, we included and summarised A: the main IMF and WB policy and lending programmes in place, and B: all WB project-level loan agreements to the health sector, in Table 10.4 (Appendix 6). We did not apply any time period constraint to the document review. This was done to allow for a better understanding of how historical and more recent IMF/WB influence have helped shape health payment patterns in Senegal, and to understand any recent and current ramifications of IMF/WB lending such as debt obligations and conditionality, viewed in the light of the historical benefits to the health sector from their loans.

From included documents, we extracted the year an IMF/WB instrument or arrangement was instituted, amount borrowed under instrument/arrangement, loan duration, the main purpose and policy content, including policy recommendations, targets, objectives and binding and non-binding loan conditionalities directly relevant to domestic health financing sources (GHE-S, health insurance payments and OOP). Direct relevance to health financing was defined as a recommendation/ conditionality *directly* pertaining to the levels and balance of the different

[29] Main policy programme documents and accompanying loan agreements reviewed. Individual WB development project loan agreement documents for non-health sectoral loans were not reviewed, while health sector specific loan agreements were reviewed.
[30] Search string: (international OR external OR official OR development) AND (loan$ OR credit$ OR lend$ OR borrow$ OR debt OR conditionalit$) AND Senegal. The search was carried out in March 2023 and repeated in August 2023.

domestic health financing sources and coverage of health financing schemes, and not working only indirectly through various upstream mechanisms. Documents were collected before, during and after conducting interviews in-country in Senegal, up until July 2024.

8.4.3.2. Interviews

We first mapped key stakeholders including relevant donor- and creditor representatives, government representatives, academics, civil society leaders and hospital management staff. We then used snowball sampling to identify additional key informants. A total of 32 stakeholders were identified for interview of which 25 agreed to participate. Interviews for this study were conducted in Dakar (Table 8.1). Interviews were conducted between September 2019 - January 2020.

Stakeholder group	**Number of participants**
Bilateral development partners	4
Multilateral development partners	4
Central government*	9
Hospital management	1
Civil Society Organisations	4
Academics	3
Total interviews	25

*Table 8.1: Interview participants: *Central government participants came from four different ministries, however the specific ministries are intentionally not mentioned to protect the anonymity of participants.*

The interview method used was Semi-Structured Interviews (SSIs). We maintained the same overall interview topics[31] and key questions for all interviewees to enable valid comparison across stakeholders, while also tailoring some questions to better fit the interviewee's expertise. Interviews were conducted in French or English, using an interpreter for interviews in French. Interviews were recorded and transcribed by a professional transcriptionist, where consent was given for this.

Informed consent for interview was obtained from all interview participants. The participant information sheet used, consent form and an example interview topic guide can be found in the online LSHTM data repository (77) and Appendix 4. All interviewee statements were anonymised when writing up the paper. The interview data were analysed using the Framework method (78). Themes were established deductively based on the research questions as well as inductively from the interviews. The thematic framework was validated

[31] Overarching topics: Stakeholder views and priorities for health sector financing in Senegal; EDP influence on public health budget, health sector implications of loans, debt repayments and IMF/WB programs and loan conditionalities. Please see online supplementary materials for further details (77).

by an independent researcher, agreed upon by the co-authors, and used to code all interview data. Interview data were coded using NVivo 12 (79). Data summaries and key quotations for each theme were written under each interviewee in a spreadsheet, or Framework "matrix" (78, 80), in Microsoft Excel (81). The final Framework matrix was then examined for emerging patterns which are described in corresponding results sections.

8.4.3.3. Quantitative data analysis

We triangulated and contextualised document and interview data for Senegal using simple, descriptive statistics of secondary data. We extracted data on Public and Publicly Guaranteed (PPG[32]) loan disbursements in Senegal separated by creditor type and PPG external debt stock and service from the WB (3, 6); government revenue and expenditure data from the IMF and WB (3, 82); total official development loans received by sector from the Organisation for Economic Cooperation and Development (OECD) (83); and GHE-S, External health financing (EXT), OOP and Voluntary Health Insurance (VHI) from the WHO (8).

Data was used as historically available in databases. WB data on public borrowing and debt were available from 1970-2022; IMF/WB data on government revenue and expenditure from 1994-2022; OECD CRS ODA data from 2002-2022; and WHO data on health financing from 2000-2021.

We analysed and presented the quantitative data as trends over time, comparing changes in public borrowing, debt burden and the levels and balance of different health financing sources over time, as well as the overall sectoral distribution of development lending in Senegal. This was done to A: examine the extent to which the health sector has benefited from development loans; B: explore associations between debt servicing levels and government health spending[33], and C: add context to interpret and triangulate findings from other sources. For this analysis, the general hypothesis was applied of an inverse relationship between debt servicing and government health spending due to a general budget constraint. For comparison, we also explored levels and changes in government education spending to look for evidence of debt servicing impacting across social sectors or differentially between them, using data from the WB (3).

[32] Public and publicly guaranteed borrowing includes debt owed by the government and by non-governmental public and private debtors such as parastatal enterprises or private companies, that have their debt guaranteed for repayment by a public entity (3).
[33] This was not done to establish causality, but rather to generate hypotheses and look for evidence supporting or challenging findings from other data sources.

8.5. Results

8.5.1. Lending and debt effects on government health spending

Results from our document review and interviews indicated that the debt in Senegal has constrained government health spending through constraining the overall government expenditure budget. However, quantitative data showed consistent real-term growth in General Government Expenditure (GGE) over the past decades, in part supported by development loans, which have also benefited the health sector. Our interviewees identified how the government prioritised economically profitable investments and servicing the public debt, resulting in limited real-term growth in GHE-S over time.

8.5.2. Trends in borrowing and debt

Real-term public borrowing in Senegal has increased substantially since 2000, along with overall government revenue, expenditure and GDP. GHE-S has not followed the economic expansion seen, instead showing limited growth over time. Development lending has benefited the health sector in Senegal, but debt obligations from external official lending appeared to also have had a constraining effect on government health spending.

Between 1970-2022, Senegal has borrowed approximately US$46.7 billion[34] from its creditors (constant 2022 US$) (6). Of this, approximately US$12.6 billion has been borrowed from bilateral creditors, US$9.2 billion from the WB IDA branch, US$8.4 billion from other multilateral creditors, US$6.4 billion via bonds[35], US$5.2 billion from commercial banks and other private creditors, US$4.4 billion from the IMF[34], and $0.5 billion from the WB International Bank for Reconstruction and Development (IBRD) branch (3).

As shown in Figure 8.4, Senegalese public borrowing increased during the 1970's, leading to debt buildup, which was partly relieved in the Heavily Indebted Poor Countries (HIPC) initiative, providing 850 million US$ in debt relief from 2000-2004 (84). Since 2000, Senegalese annual borrowing levels from foreign creditors have risen substantially, up from approximately $0.3 billion in 2000 to $1.7 billion in 2022 (constant 2022 US$) (3). Increases were most pronounced from 2016 and onward, in part due to the issuance of US$5.4 billion worth of bonds (Eurobonds) in separate tranches, beginning in 2009 (3, 85-87) (Figure 8.4). By 2022, Senegal owed a total US$16.1 billion[34] to its creditors (3). Of this, $4.1 billion was

[34] This number includes drawings made on the IMF general resource account, not the reserve tranche, for which we were unable to find a data source. IMF disbursements and resulting outstanding credit are not counted in PPG external debt figures and were added to attain the aggregate numbers presented.

[35] Some of the amount borrowed via bonds may be double counted in the other categories, as these creditor types may buy government bonds, however we were unable to identify more detailed data on the holders of Senegalese bonds to be able to avoid this.

owed to bondholders, US$3.7 billion to the WB IDA, $3.0 billion to other multilateral creditors, $3.0 billion to bilateral creditors, $1.6 billion to the IMF[34], and $0.8 billion to commercial banks and other private creditors (3, 6) (Figure 8.4).

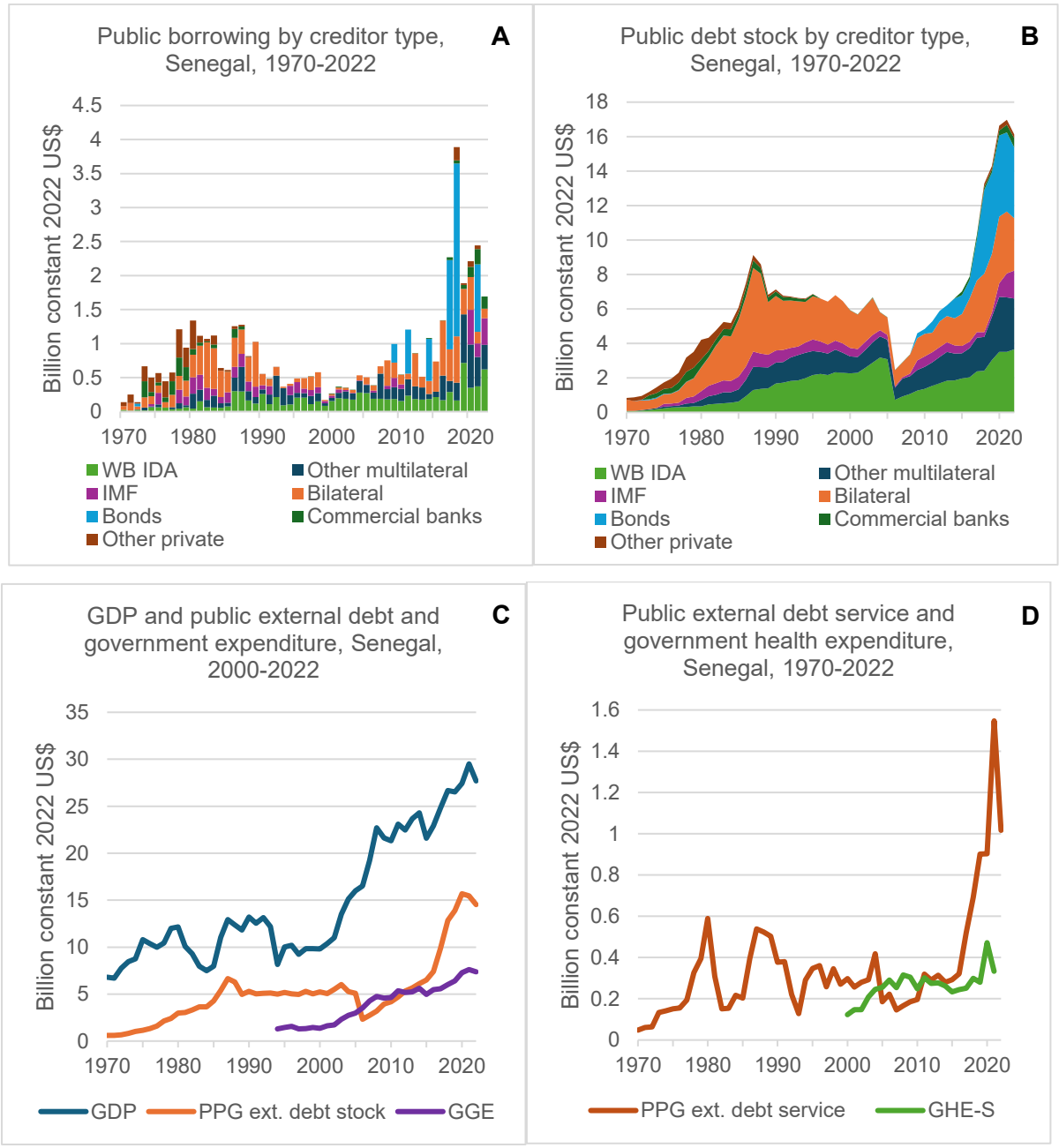

*Figure 8.4: **Panel A**: Public and Publicly Guaranteed (PPG) borrowing in Senegal separated by creditor type, 1970-2022 (billion constant 2022 US$) (3, 6). Data are for disbursements, i.e. transfers made in each year (flows, as opposed to stock in Panel B). IMF loan disbursement data is only available for drawings made on the IMF general resource account, not the reserve tranche. **Panel B**: PPG debt stock in Senegal from 1970-2022 (6). IMF credit includes all IMF loans except amounts drawn against the country's reserve tranche position. It includes Special Drawing Rights (SDR) allocations (6). Note: There may be some overlap between "Bonds" and the other creditor categories as these may buy Senegalese bonds, however we were unable to identify more detailed data on the owners of Senegalese bonds to be able to avoid double counting. **Panel C**: Gross Domestic Product (GDP) (1970-2022), PPG external debt stock (1970-2022), and General Government Expenditure (GGE) in Senegal (1994-2022) (3, 82). **Panel D**: PPG external debt service (1970-2022) and*

Government Health Expenditure as a Source (GHE-S) (2000-2021) in Senegal (3, 8). (Data deflated using WB US$ GDP deflator (3). Note: PPG external debt does not include the use of IMF credit (6)).

The PPG external debt of Senegal corresponded to 52% of its GDP in 2022, well above the average for other LMCs (15%) and SSA countries (23%) (Figure 8.1) (3). In 2021, real-term PPG external debt servicing peaked at US$1.5 billion (constant 2022 US$), corresponding to 20% of GGE, outgrowing GHE-S by a factor of about 4.7 (Figure 8.4) (3, 8, 82).

Several interviewees across stakeholder groups were of the understanding that external official loans predominantly went to economically profitable sectors (natural resources, production, manufacturing etc.). The government and donors were described as being jointly interested in ensuring a return on investment:

"I think lending goes more into the economic sectors, and the health and social sectors are less important… The donors or partners who finance … expect a return on investment. They have not invested much in the social, the social is not economically profitable, so many partners prefer to invest in the economic than in the social." (CSO)

A government interviewee concurred that they encouraged external official loans where these could be profitable:

"… Now more and more, we still want to guide partners to finance loans especially in areas that can be profitable". (Government)

Figure 8.5 shows the distribution of development loans received in Senegal between 2002-21 by sector (83). Health and population and reproductive health have received approximately 6.5% of all development loans, compared to 33% to economic sectors, 12% to production sectors, and 6% to the education sector (83).

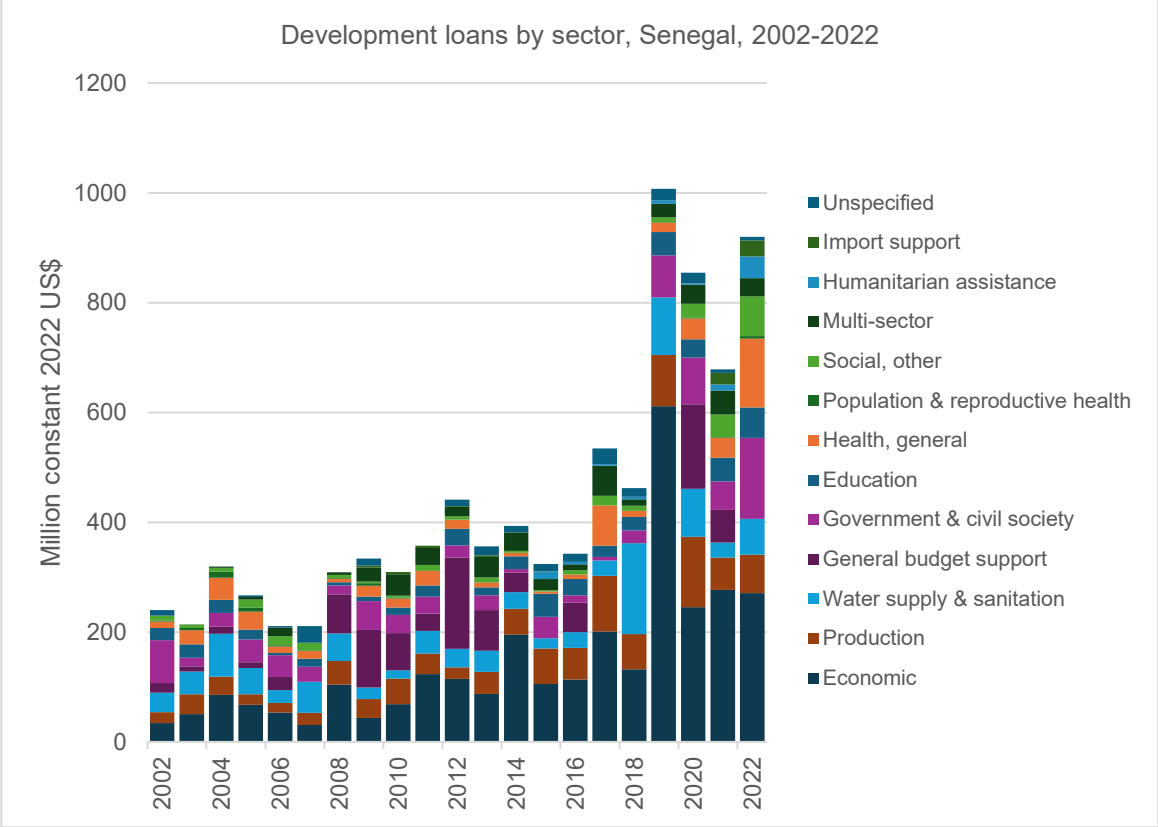

Figure 8.5: Total official development loans received by sector, Senegal, 2002-22. This chart is based on OECD CRS data in constant 2022 US$ (83). No data available before 2002.

As seen in Figure 8.6, a growing share of ODA for health is disbursed as loans in Senegal, up from 3% in 2015 to 67% in 2022 (83). This follows a general, though less marked trend for ODA across all sectors in Senegal.

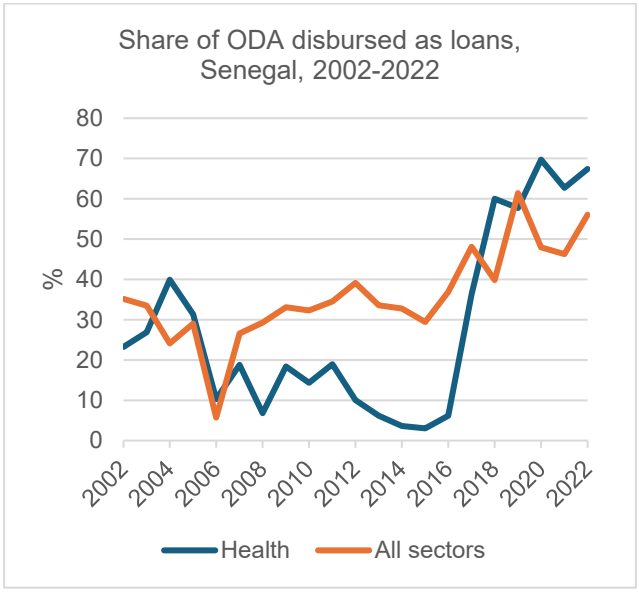

Figure 8.6: Share of official development assistance provided as loans in Senegal from 2002-2022 (83). "Health" includes both the categories "Health" and "Population policies/Programmes & reproductive health".

8.5.3. Lending directly benefiting the health sector

Although not the primary focus of ODA lending, the general observation can be made that ODA lending has benefited the health sector directly. This included the examined case of WB project lending to the health sector from the 1980's up until today (Table 10.4, Appendix 6). Identified WB project lending for the health sector has gone to health systems strengthening; family planning; infectious disease control; results-based financing for health and nutrition; establishing and expanding exemption schemes and CBHI; improving utilization of reproductive, maternal, neonatal, child and adolescent health and nutrition, and more (88-95)[36].

As for the IMF, except for the case of supporting the country's Covid-19 response, IMF lending did not directly target the health sector but was instead disbursed to address balance of payment issues and support the general adjustment policy programmes in the country (Table 10.4, Appendix 6).

The observation that more ODA for health is disbursed as loans means that direct benefit to the health sector from ODA lending has increased accordingly. This has not occurred at the expense of ODA grants for health, which have gone from US$155 million in 2015 to US$163 million in 2022 (constant 2022 US$), but reflects an overall expansion of ODA for health (Figure 8.3) (83).

8.5.4. Lending indirectly benefiting the health sector

Lending to the economic and production sectors could have indirectly supported increases in GHE-S by strengthening the foundation for raising revenue for the public budget, some of which could be spent on health. In part supported by the increased lending seen, Senegalese government revenue has grown from US$1.4 billion in 2000 to US$5.5 billion in 2022 (constant 2022 US$) (Figure 8.7) (82). Senegalese GGE has grown from US$1.4 billion in 2000 to US$7.4 billion in 2022, while GDP has grown from $10 billion in 2000 to $28 billion in 2022 (constant 2022 US$) (Figure 8.4 and Figure 8.7) (3, 82). GHE-S has however halved as a share of GGE, from 9.0% in 2003 to 4.4% in 2021 (Figure 8.7) (3, 8). Following steady increases from 2000-2005, GHE-S did not increase in real terms between 2005-2010 despite low PPG external debt servicing levels after HIPC debt relief was granted between 2000-2004 (84) (Figures Figure 8.4 and Figure 8.7). GHE-S was $290 million in 2006 and $280 million in 2019 (constant 2022 US$), corresponding to a real-term decrease from $26 per capita to $18

[36] Both broader WB lending under multi-sectoral development strategies as well as individual project lending has of course benefited across a multitude of sectors in Senegal (96).

per capita[37] (Figure 8.7) (8). This was followed by a significant, but temporary, increase to respond to Covid-19 in 2020 (Figure 8.7) (8).

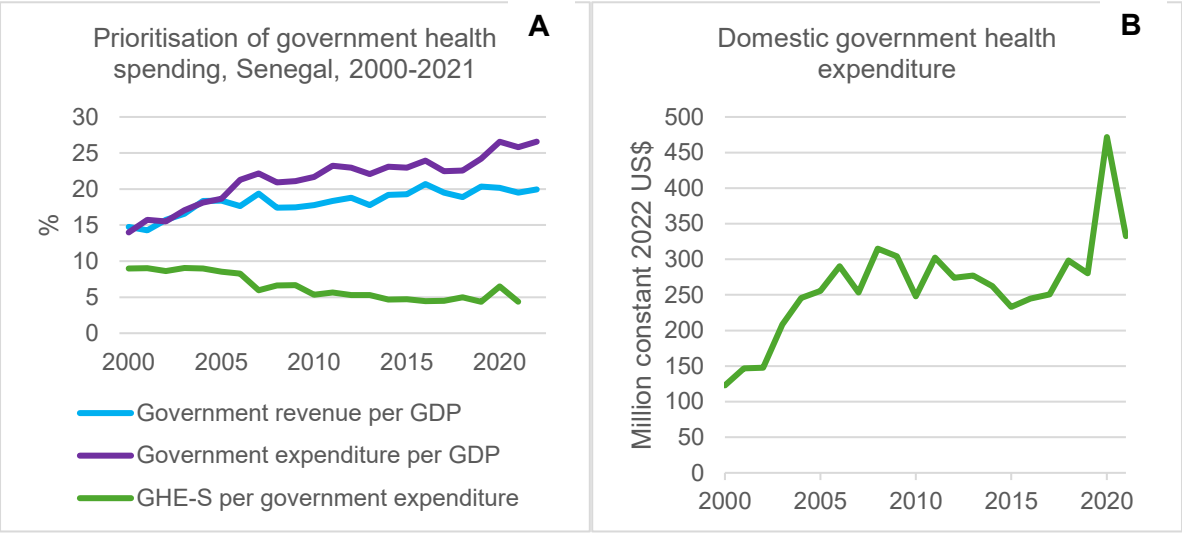

Figure 8.7: Panel A: General Government Expenditure (GGE) and government revenue as a proportion of GDP (2000-2022) and Government Health Expenditure as a Source (GHE-S) as a proportion of GGE (2000-2021) in Senegal (8, 82). Panel B: GHE-S from 2000-2021 in Senegal (8). (Data deflated using WB US$ GDP deflator (3).

There is therefore limited evidence supporting this indirect pathway of influence, although the counterfactual trend in the absence of lending is unknown.

8.5.5. Debt and health expenditure

Our findings pointed to a constraining effect of public debt servicing on government health spending. Government prioritisation of servicing its debt obligations was explained as receiving higher priority than funding the health sector, along with making profitable investments to ensure economic growth. The education sector appeared to suffer less from a debt servicing constraint than the health sector, possibly due to receiving higher government priority.

A constraining effect of debt on social spending in Senegal has been acknowledged in official country reports both when debt levels were highest around the turn of the millennium, and again in 2020. The 1998 Enhanced Structural Adjustment Facility (ESAF) policy framework paper recognised that "*the fiscal burden* [of external debt] *remains high, however, with debt service to revenues projected to be 38 percent in 1998. This makes it more difficult to increase expenditures, including for the priority sectors of education and health"* (97). In the 2002 Poverty Reduction Strategy Paper (PRSP), it was similarly stated that: "*the country's debt burden is a major obstacle to efficient allocation of public resources in favour of the social*

[37] Numbers deflated using US$ GDP deflator data for consistency across figures (3).

sectors" (98). In the recent context of Senegal's growing debt burden, a 2020 IMF country report for Senegal stated that: *"… debt service continues to absorb a sizable portion of fiscal revenues, thus limiting room for other expenditures in critical areas such as infrastructure investment, health, and education"* (99).

Approximately half of participants, representing all stakeholder groups, believed that Senegal's debt constrained the public budget, including the health budget. Some did not believe that this was the case, while others were not knowledgeable on the matter.
Several interviewees across all stakeholder groups believed a constraining effect of Senegal's debt to impact across all sectors. A government official explained how the health sector was not exempt, and the government at times had to cut them to meet debt obligations.

"We live it every day… Because we are obliged to pay the debt … we are obliged to make budgetary regulations on such sensitive sectors as health, education, even though we try to spare them." (Government)

A donor concurred:

"Absolutely, [debt obligations are] *going to affect the health sector because we know that these loans … the government of Senegal will have to respect their engagement in terms of timeline. If during this time … they have to pay back these loans, they don't have enough resources, they have to cut somewhere. And when they cut, the health sector is also affected."* (Donor)

Two CSO leaders and the cited donor representative however believed that the health sector was affected more heavily by debt constraint than other sectors.

"*The IMF sets an objective to the government in term of what should be the level of debt and deficit each year. And so … the government needs to adjust its budget accordingly and so at the end of the day it's the budget for social sectors that are cut*." (Donor).

This interviewee did however attribute this to the government and highlighted the change in attitude from the WB toward prioritising social sectors.

When comparing the two main social sectors, total government education expenditure has been consistently higher than total government health expenditure, and increasing in real terms over time (domestic and external source, including capital expenditure)[38] (Figure 8.8)

[38] Education and military expenditure data shown in Figure 8.8 also include government capital expenditure, which is not available for the full time series for the health sector. The figure therefore only shows total government current account health expenditure (domestic and external source). In 2020, domestic government capital health expenditure was US$87 million, and external capital health expenditure was $124 million, some of which may have been channelled outside of the government (constant 2022 US$). This leads to the provided range of total government health spending being 1.7-2 times less than total government education spending in 2020.

(3, 8). No pattern was identified between year-on-year changes in PPG external debt servicing and total government current health spending.

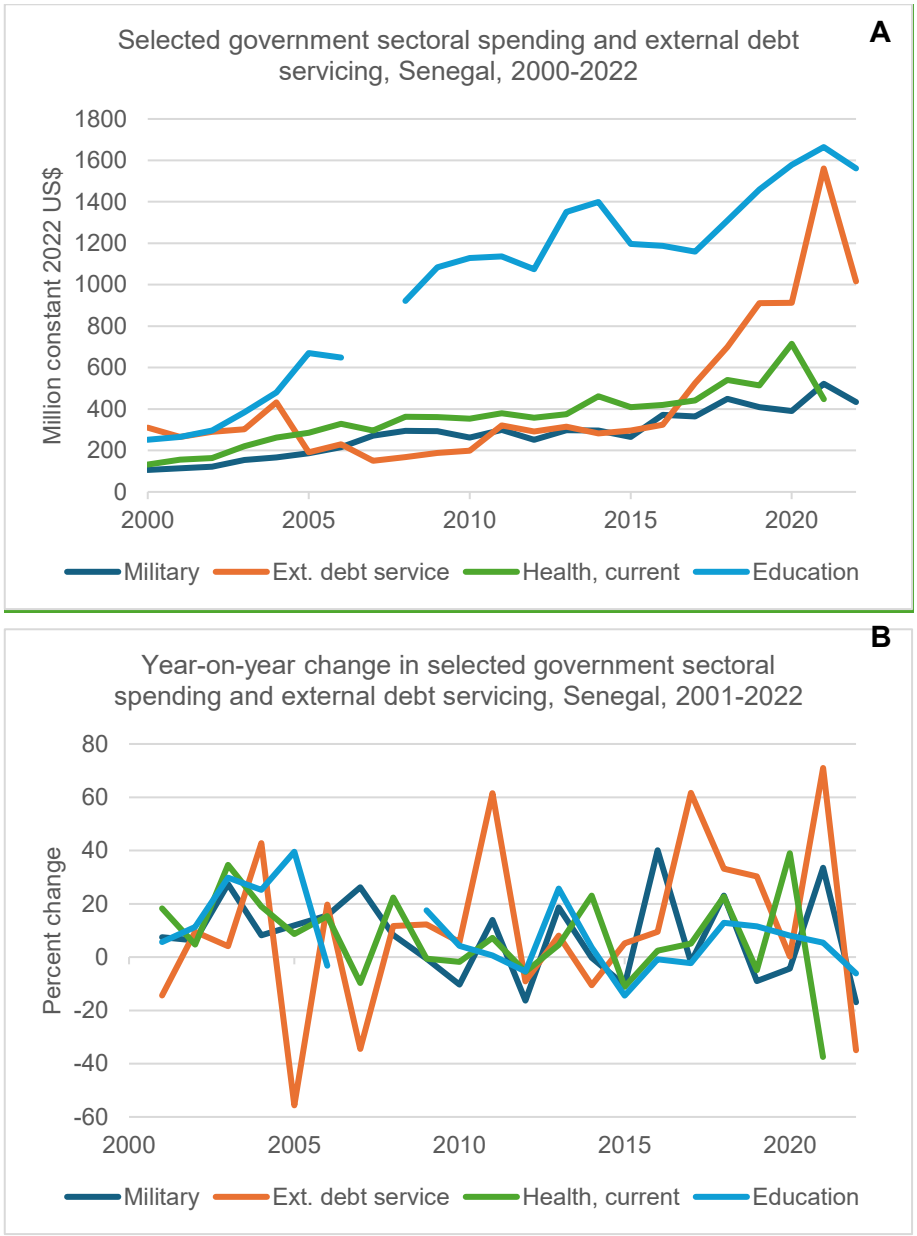

Figure 8.8: Panel A: Selected government sectoral spending and Public and Publicly Guaranteed (PPG) external debt service in Senegal, 2000-2022 (constant 2022 US$) (3, 8). Panel B: Year-on-year changes in government spending for same sectors and PPG external debt service in Senegal, 2001-2022 (3, 8). Figures include external transfers via government. Education and military expenditure also include government capital expenditure, which is not available for the full time series for the health sector, so figure only shows total government current account health expenditure (domestic and external source). For 2013-2020, total capital health expenditure via the government was at least US$18-87 million (lower bound, excluding external) and maximum US$34-211 million (upper bound, including all external, some of which may have been channelled outside of the government) (constant 2022 US$).

In 2020 (latest comparable data), total government education expenditure was 1.7-2 times total government health expenditure (3, 8). ODA levels for health and education have been similar since 2002, except during 2021-22 when ODA for health became predominant due to

Covid-19 (83). Differences in ODA therefore do not explain differences in government spending. Across SSA, education sectors do receive more government funds than health sectors, however at about 15.5% of GGE for education and 11.1-12.1% of GGE for health, corresponding to a factor 1.3-1.4[39] on average (including domestic government current and capital spending, and external transfers via government) (3, 8). The Senegalese government thus appears to have given relative priority to the education sector, and any constraining effects of debt servicing present seem to still have allowed the government to provide significantly more and increasing levels of education spending compared to health spending. An academic explained that the government prioritised the education sector above debt servicing and the health sector below both:

"*Health is* [number] *7 … in the hierarchy of priorities in Senegal … 1 is education, 2nd is roads, the third is debt payment*." (Academic)

This would help explain why the education budget would be less likely to be constrained by debt servicing requirements than the health sector as a result of government prioritisation.

A few interviewees highlighted certain government prioritisations made under budget constraint, driving spending away from the health sector, some of which were thought to be exacerbated by debt servicing obligations. This included a focus on sectoral visibility, profitability, a belief in economic growth as first priority before social sectors, and cutting the health sector due to the presence of donors.

An increased focus on sectoral visibility due to a debt servicing constraint on the government budget was explained by a CSO representative as politicians focusing spending where it would help secure re-election, when there was little left to spend:

"If the money mobilized to repay the debt … returns to the donors, the government which does not have much means will prioritize … and they are not going to put it into health. They will put it in another much more visible sector to say that "I am building an airport, I am building roads". … I have never seen a politician during an election campaign say that "I treated so many people" … They say: … "I don't have a lot of money. The little I have, I put it in the sectors that allow me to be re-elected in the next elections". (CSO)

Lack of profitability of the health sector was also believed by the same interviewee to be an explanation for why the sector received less government priority and was subject to budget constraint from debt servicing obligations:

[39] The lower bound includes all external capital health spending, while the upper bound does not, as it is not specified whether these funds are distributed via government or not.

Q: "Do you think the health sector is more affected than other sectors in terms of being constrained to pay off debt?"

A: "*Yes I think so … As I said, health, the social, is not profitable. This is why we do not prioritize it.*" (CSO)

A CSO leader also saw health and social protection investments as receiving last priority among government expenses, exacerbated by the weight of the debt:

"*When we advocate towards the ministry of the budget to put more money into health and social protection, in general they say that what remains of the budget cannot cope with all those expenses … The fiscal space in our countries is very small … From this budgetary space you must first pay the debt, after that the security, the sovereign expenses, the operations, before being able to give water and health to the populations … The weight of the debt does not allow to invest in basic social services.*" (CSO).

Another dynamic was identified by a donor in which the presence of donors to step in and cover costs in the health sector rendered this sector more likely to be subject to budget cuts during the financial year to meet debt obligations:

"[Cuts due to debt obligations] *can affect any sector, but specifically for the health sector, and the reason it's going to affect more the health sector is the government knows that the health sector will receive more donor resources compared to the others"* (Donor).

8.5.6. IMF/WB policy recommendations and conditionalities and health financing sources

We approach this section historically, because a key finding was that both IMF and WB health financing policy recommendations and conditionalities in Senegal evolved over time. This was especially the case for the WB from the launch of Senegal's PRSPs in 2002 and onward.

Throughout Senegal's history of engagement with the International Financial Institutions (IFIs), policy recommendations, targets, objectives, and loan conditionalities from the IMF/WB have included austerity measures working to balance the government's books by increasing revenue and controlling public spending. This has had a double-sided influence on the overall scope for government health spending. In the 1980's and 1990's, the WB promoted user fees, hospital autonomisation and private health service delivery, along with increased government health spending. Especially after 2002, an increasing number of targets and safeguards were put in place from the IMF/WB to protect and increase government health spending, accompanied by a mixed health financing approach from the WB, expanding Community-Based Health Insurance (CBHI) while building the role of the private health sector. IMF/WB efforts have however failed to achieve real-term increases in GHE-S between 2006-19, and OOP has prevailed. Our findings pointed to lingering IMF/WB policy influence from the 1980's

and 90's as a possible explanation for this, as well as government priority of economic growth and servicing its debt to the IMF, WB and other creditors before investing in the health sector.

A government official explained how an evolution in IMF conditionalities had occurred:

"The conditionalities have evolved a lot since the 80's … Now it's the benchmarks … This question of human capital … The monetary fund took it up because of the criticism that was made of the adjustment programs of the 80's and 90's" (Government)

A CSO representative concurred for both IFIs:

"*Our relations with the World Bank … and IMF have evolved much … The IMF come just to see if the macroeconomic framework really respects basic principles… For the World Bank [their role] is more to support priority development programmes … The World Bank had led the government not to finance social sectors, whereas now we have seen that the World Bank supports certain health initiatives.*" (CSO)

A donor representative explained that while the WB had evolved toward prioritising investing in human capital through social spending, there was still a belief within the government that economic growth through investments in productive sectors and industries was more important:

"*There still is that belief that first economic growth with investment. Productivity, industries, and that investing in people is nice to have when … you can afford it. And even though that's changing a little, and we see that change from the World Bank, still it's here… I would not be surprised if within the government in Senegal, some people believe that investing in people is a waste of money... So they cut social spending.*" (Donor)

8.5.6.1. IMF/WB influence on health financing sources before year 2002

8.5.6.1.1. 1966-1995: Structural adjustment, austerity and health cost sharing

Table 10.4 (Appendix 6) provides a historical overview of the IMF and WB arrangements and instruments in place in Senegal since 1966. Senegal first became a member country of the IMF and the WB in 1962 (68, 100), and the country received its first loan from the WB in 1966 (100, 101). Following economic difficulties in the late 1970's, Senegal's first IMF/WB Structural Adjustment Program (SAP) was initiated in 1979 (102-105), and structural adjustment occurred through the 1980's and 90's (33, 98, 102, 104, 105). IMF/WB prescriptions were centred around public austerity, privatization, decentralization, market liberalization, stimulating growth and exports, increasing domestic revenue mobilisation and reducing the size of the civil service (33, 102-104, 106-116).

In the early/mid 1980's, government adherence to structural adjustment measures was limited (33, 108, 116). Real current health expenditures declined by 21% between the first and second halves of the 1980's, which was scarcely attributable to IMF/WB influence given that government compliance with their recommendations was limited (33, 108, 116, 117). Figure 8.9 shows the composition of total health financing sources in Senegal in 1981 and 1989 (116). Overall little change was seen over this decade, though with a slight relative decrease in government health financing and OOP/health insurance with limited private sector and external financing expansion.

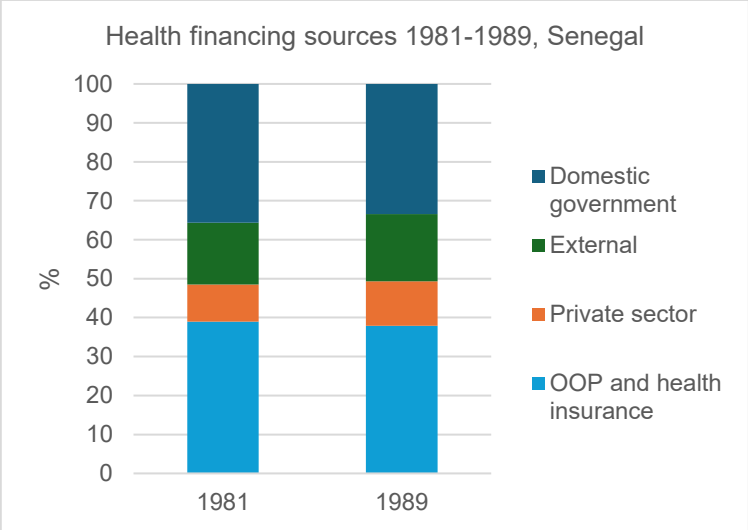

Figure 8.9: Composition of total health financing sources (capital + current) between 1981 and 1989 in Senegal (116).

From initial nonconformity, Senegal's compliance with IMF/WB policy prescriptions increased between 1985 and 1996 (33, 108, 116, 117). Public expenditures were cut, and while government current health spending increased from 4% to 5.5% of total current expenditure from 1986-96, it stagnated as a percent of GDP around 0.5% over this time period (116). In 1984 and 1987, the WB had recommended for the government to consider cost sharing (i.e. user fees) before embarking on projects to improve or expand health service coverage, because the government could not expect to be able to finance the recurrent costs of such projects (104). These recommendations continued from the WB (118), and user fees were introduced from 1985 and onward to help pay for primary health services in the context of public sector austerity (33, 108, 111). This was also facilitated by the UNICEF/WHO Bamako Initiative adopted by African health ministers in 1987 and implemented in Senegal in the 1990's. The initiative involved patients paying into so-called revolving drug funds so that facilities could recover their costs, restock drugs and locally balance their finances in a decentralised fashion (33, 114, 119-121).

A 1991 WB health project in Senegal had as an objective to "*restructure the health sector to enable it to provide improved basic health services*", which included private sector provision of family planning services (90). In 1993, the WB recommended for Senegal to develop health insurance and drug cost recovery, whilst also protecting expenditure on health "*to ensure minimum efficiency of public services*" (114, 116). This however now came with the target of significantly increasing current health expenditure out of total government expenditure from 4.1% in 1989/90 to 6.7% in 1995 (116). An academic interviewee commented that:

"The World Bank published a document, that inspired our government which is "Investing in Health". Otherwise, the money spent in health was perceived as expenditure and not investment … When they said "investing in health", they started pushing the government to invest more money in primary health care which was good … Senegal took over from UNICEF the funding of the immunization program, which was for us a big success, started putting more money in programs like malaria". (Academic)

8.5.6.1.2. 1995-2002: Increased government health spending, mixed health insurance schemes, health cost sharing and hospital autonomisation

From 1995 up until around 2002, policy recommendations under the IMF Enhanced Structural Adjustment Facility (ESAF), Poverty Reduction and Growth Facilities (PRGF) and WB Country Assistance Strategy (CAS) focused on similar means of public sector austerity and private sector liberalisation. However there was now a new emphasis, particularly from the WB, on equity, poverty reduction, promoting the status of women, environmental and social sustainability (97, 103, 109, 122-126). IMF and WB recommendations now targeted an increase in current budget share allocation to health from 6% in 1996 to 9% in 2002, though with greater use of beneficiaries (i.e. patients) and NGOs in the financing of basic health care services (97, 109, 126). The IMF recommended a mixed health sector financing approach, with increased government financing emphasizing primary health care and improved access of vulnerable groups to health services, combined with decentralized cost sharing, formal sector health insurance, CBHI, and private sector health insurance (97, 122-124, 126).

In 1998, the government enacted a national hospital reform where hospitals were made autonomous and user fees for their services were introduced (127, 128), described by World Bank staff as: "*Senegal has virtually privatized its hospitals*" (128). An academic commented:

"The spirit of the World Bank was to tell governments: "Stop spending for the hospitals and trying to get free services at the hospital level. Let people who can pay, pay. Let people who are poor be organized in community insurance, that is the mutuals." (Academic)

IMF/WB promotion of Mutuelles was corroborated in an ESAF policy framework paper from 1998 (97). A hospital management staff member in Dakar believed that past IFI influence on the health service payment pattern in the 1990's had lingered on:

"… The international institutions [mentions IMF] encouraged the state to reform the health system. And it is this health system reform that has precisely recommended payment for healthcare by the population with financial autonomation of hospitals… Still the same rhythm of payment for population health care at their own expenses [is there today] *… in terms of who pays there is no evolution"* (hospital management staff member).

Besides the above policy recommendations, no specific IMF/WB conditionality for health financing sources was identified until 2007 (below section).

Senegal's HIPC program launched in 2000, with debt relief criteria consisting of privatisation of public sector enterprises and liberalisation of the private sector, increased DRM, along with social objectives including increasing primary health centre utilization (84, 129).

8.5.6.2. IMF/WB influence on health financing sources from 2002 and onward

8.5.6.2.1. 2002-2010: Increased government health spending, debt relief, and mixed health insurance schemes

Starting in 2002, Senegal's PRSPs were launched. PRSPs I and II ran from 2002-2010, supported by IMF loans via the PRGF and WB IDA loans and grants via Poverty Reduction Support Credits (PRSCs). These had a similarly austere fiscal policy stance as previously, but with a series of stipulations to support the health sector. This included increasing budget allocations to health, allocating HIPC funds to the health sector, improving access for vulnerable groups to health insurance schemes, expanding CBHI and formal sector health insurance mechanisms as well as the role of the private sector in health service delivery (98, 130-138). They also involved subsidizing health care and establishing a health risk protection system for vulnerable groups, reducing the financial burden of payment for health services for the poor, and expanding health insurance cover for formal sector employees and dependents (135, 136, 138-144). The overall aim was for 50% of the population to be covered by health insurance by 2015, compared to 8% in 2005. Accompanying conditionalities in loan agreements directly pertaining to health financing included a WB indicative trigger (non-binding) to extend a pilot of health insurance for transport and agricultural sector workers (136); and triggers (non-binding) and prior actions (binding) to prepare and implement a state financial support mechanism for health mutuals (CBHI) and supporting 50 new health mutuals (144). PRSC I (2004) and II (2005) also contained triggers and prior actions (PAs) to decentralize budget execution in the health sector (135, 138). Between 2003-2006, the budget execution rate for the health sector increased from 73% to 94% (135), which is a direct way

of increasing GHE-S within the existing budgetary framework, and GHE-S did increase substantially in that time period (Figure 8.7).

PRSC III (2007) had as objectives to increase state subsidy of essential drugs and services, and government-enforced stronger controls on drug tariffs, notably in remote regions (136). Prior actions (binding conditionality) under PRSC III required a harmonized tariff system to control tariffs on drugs, in order to lower the burden of payment on the poor, taking steps to expand CBHI, and establishing public subsidies for essential health services for vulnerable groups (136). It also included an indicative trigger (non-binding) requesting an extension of a pilot program providing health insurance to uninsured workers in the transport and agricultural sectors, working to increase prepaid and pooled financing for these groups, and an indicative trigger requesting enhancement of contracting with the private sector in health service delivery (136). A CSO leader was critical of IMF/WB promotion of the private sector in health due to the difficulties for poor people to pay for private health services:

"[The World Bank and IMF]*, their ideology is first to say less state. The state must reduce its market intervention and guarantee more space for the private sector… [But] it is not the job of the private sector to provide basic social services … to take care of those who don't have the resources to enter the market… It is to generate profits for its shareholders, and therefore … there is a risk of not having quality social services or a good geographical distribution*" (CSO).

8.5.6.2.2. 2010-onward: Austerity, safeguarding health spending, exemption schemes and CBHI

In the 2010's, IMF fiscal policy objectives, articulated through Policy Support Instruments (PSIs, non-financing instruments), were of a similar nature as previously, however the first social spending floor (non-binding) was introduced from 2010 at 35% of total government spending (145). This would remain until 2022 where it was increased to 40% (146). Senegal consistently met and frequently exceeded the social sector spending floors by a few percentage points. However, since 2010, the Senegalese government has spent between 19% and 26% of its total budget on education, so it has met these floors primarily by funding the education sector (3). Fiscal prudency measures were recommended by the IMF to increase fiscal space for social spending (147), and frontline health workers were exempted from a wage bill freeze (148).

The third IMF/WB PRSP running from 2013-17 aimed to establish UHC including through health mutuals, extend free healthcare to vulnerable groups, set up a health solidarity fund, target 95% health budget execution, and increase the health mutual scheme coverage rate to

66% by 2017 (149, 150). WB conditionality gradually moved away from making stipulations for the health (and other) sectors and instead simply required that the WB IDA was satisfied with the existing development programme and macroeconomic policy framework in place (e.g. (151)).
Promotion of a mixed health financing approach in PRSPs was found to align with the government's overall development strategy for the health sector (152-154).

From 2020 onward, the IMF disbursed loans via different facilities for the Covid-19 response, accompanied by a Policy Coordination Instrument (PCI) (non-financial), jointly supporting increased health spending while increasing the social spending floor to 40% of total government spending (99, 146, 155-160). A temporarily increased fiscal deficit was allowed to respond to the pandemic before fiscal consolidation was again recommended in 2023 (161).
The WB also supported the Senegalese emergency health system response to Covid-19 and the country's UHC programme, aiming to improve its progressiveness, expand coverage, expand grants/subsidy under CBHI ("*Mutuelles*") for poor and vulnerable groups, and expand maternal health vouchers ("*Gratuités*") (67, 93, 94, 162).
In spite of these policy changes over time, an academic explained that governments would still limit investments in the health sector due to the general austerity requirements from the IFIs:

"*All the countries that work with [the IMF and WB], countries that are in economic difficulties, that are being asked to cut certain positions… Even if they don't cut for health, they will no longer invest in this sector.*" (Academic)

8.6. Discussion

With this study, we aimed to unpack the ways in which external official lending, debt and associated IMF/WB policy influence have affected the different domestic health financing sources in Senegal. We found that Senegal has gone through a journey in this regard, containing the following phases:

The 1980's and '90's were characterized by relatively high public borrowing, a high debt burden, and IMF/WB austerity prescriptions, user fee promotion, and promotion of hospital autonomisation and private health service delivery, though also with recommendations to increase government health spending. Our findings lended support to the hypothesis that some of the prevailing issues in Senegal with relatively low progressivity in the mix of health financing sources in Senegal in part stem from IMF/WB influence from this era, in spite of an ensuing evolution in policy stance, particularly from the WB.

The 2000's were characterized by debt relief, low public borrowing, ongoing IMF fiscal austerity measures though with a series of measures to support the health sector, increasingly progressive health financing policy influence from the WB, IMF/WB-promoted CBHI expansion, and growing GHE-S in the first half of the decade followed by decreasing budget priority and real-term stagnation. WB binding conditionality for decentralization of health sector budget execution in 2004-05 led to strong increases in health budget execution rates (135, 138). These efficiency gains supported significant real-term increases in GHE-S between 2004-06. The decreasing government budget priority in the latter half of this decade pointed to government prioritisation as an important co-determinant for why real-term GHE-S began to stagnate. The major debt relief granted did not translate into GHE-S increases in real terms when debt servicing levels were low following debt relief, and it seems an opportunity was lost when the country could have made significant strides towards more equitable payment patterns in the health sector.

The 2010's were characterized by marked increases in public borrowing, debt stock and debt servicing, and in spite of a series of policy recommendations and conditionalities from the IMF to protect and increase government social and health spending, and increasingly progressive WB health financing policy influence, no real-term gains were seen in GHE-S, and OOP prevailed. In 2020, a temporary increase in GHE-S was seen to respond to Covid-19, partially reverted in 2021.

While IMF policies to some extent and especially WB policies pertaining to health financing have evolved over the past two decades, it seems they have been somewhat ineffective in transforming the health payment patterns in Senegal. Government priority of profitable investments, economic growth and debt servicing, including to the IMF and WB and following their recommendations, as well as ongoing austerity measures and lingering influence from IMF/WB-promoted health system reforms in the 1980's and 1990's, were identified as possible explanations for why the degree of progressivity in the mix of domestic health financing sources has not improved much over time. The explanation of government priority of the education sector before debt servicing requirements also pointed to a differential impact of debt servicing obligations between the two sectors due to this government prioritisation. While investments in education could help support economic growth and thereby the revenue basis for GHE-S, such synergies were not reflected in trends in GHE-S over time in the period of study. They could however materialise in the future, provided GHE-S receives increasing budget priority out of GGE.

Going forward, if the cycle continues of lending primarily for economic growth and meeting increasing debt obligations before investing in the health sector, the outlook for a revitalisation of the budget priority given to the health sector looks somewhat limited.

Separating the different pathways of influence identified (Figure 8.2), external official lending was associated with a continued expansion of overall government revenue and expenditure, and development loans supported the health sector directly, although to a much lesser extent than economic and productive sectors. However, the majority of participants who held knowledge on the matter, across all stakeholder groups, believed that Senegal's ensuing debt burden constrained the public budget, including the health budget. Official IMF and WB documents from 1998, 2002 and 2020 supported this assessment (97-99). Given the consistent growth of Senegalese GGE (Figure 8.7), these observations should be interpreted as relative considerations of public expenditure growth rates, and the counterfactual of GGE in the absence of external official lending is not known.

Our findings indicating that Senegal's debt obligations had a constraining effect on government health spending extends some previous findings by other authors. Two studies of the period 1970-2000 found that the Senegalese government spent around 20 percent of its resources on debt servicing (163, 164), and that a one percent increase in debt servicing was associated with a reduction in total domestic expenditure by 0.13 percent of GDP (163, 164). Our findings also align well with multi-country econometric studies, generally finding negative associations between debt variables and government health spending (11, 13-16, 18, 165) (one study has had more variable findings (17)).

Whether IMF/WB policy influence has historically constrained or supported government health spending has been a subject of heated debate with academics and civil society on one side and IMF/WB staff on the other (12, 20, 25-43). Our results point to a mixed effect, in part due to lingering influences from past policies, and due to ongoing austerity policies on one side and efforts to increase GHE-S on the other. The ongoing WB promotion of CBHI and private health service delivery may also have limited the scope for progress on UHC in Senegal. Issues with CBHI in Senegal have included voluntary enrolment with limited reach, user co-payment, small risk pools, variable financial sustainability and risk protection of poor members, and limited cross subsidy from rich to poor (166-171). In the general literature, private health service delivery has been associated with increased service costs, inequitable availability and access patterns for poor and vulnerable groups, high user co-payments and failure to advance financial risk protection (172-174). This mixed health financing approach is however in line with the government's overall development strategy for the health sector (152-154).

Our finding that WB policy had become more progressive over time in Senegal seems to follow a general evolution within the WB (175-177). A lesser degree of change was seen at the IMF in Senegal, which aligns somewhat with findings across countries from other authors (44). However, our findings of social spending floors being raised over time, funding to respond to Covid-19, and numerous measures to increase and safeguard social and health spending, did show some signs of a transition from traditional austerity policy towards increasing social concern at the IMF.

We found that social spending floors were consistently met or exceeded, which is not the norm across West Africa, though mainly by prioritising the education sector (44, 161). An issue with IMF social spending floors is that the IMF defines social spending in Senegal very broadly, covering a range of sectors and purposes (161). In other countries, IMF definitions of social spending vary widely, and the health sector is not always included or explicitly mentioned (178). This means that countries can focus their spending heavily on variable subsets of social purposes and satisfy this non-binding target, which somewhat dilutes the meaning of a social spending floor from the perspective of individual sectors, including the health sector. In a traditional economic growth logic, investments in education, water supply, electrification and sanitation could receive priority over investing in the health of poor and vulnerable groups.

Finally, it deserves mention that while this paper focused on the modality of development lending, we acknowledge the important EDP contribution of providing grant financing. In spite of its decreasing share over time, it has provided 82% of ODA for the health sector in Senegal on average between 2002-2022 (83). This is included in the assessment of ODA impacts on domestic health financing in Chapter 7.

8.6.1. Limitations

Unpacking our macroeconomic and fiscal dynamics of interest is inherently complicated, with complex causal chains, numerous contemporaneous determinants and competing political considerations. This served as the motivation for our multipronged methodological approach and led us to focus more on identifying and discussing different pathways of effect while remaining cautious about drawing causal inferences.

Using descriptive statistics based on relatively short observational time series to quantitatively assess sectoral impacts from cross-sector fiscal level burdens proved challenging. This is an inherent statistical limitation when using single-country observational macroeconomic data, further complicated by the fact that debt impacts the general public budget before sectoral

allocations. Using complementary data sources such as individual stakeholder accounts or written documentation of fiscal policy influences were necessary to discuss possible causal relationships.

This study focused on policy influence from the IMF/WB, however there are of course other external official creditors to Senegal, multilateral and bilateral. The influence mechanisms from the main bilateral EDPs in Senegal have been explored in Chapter 6, however an in-depth exploration of loan conditionalities from e.g. the French Development Agency or the African Development Bank might reveal different results, potentially expanding and amending the framework and understanding presented in this Chapter.

In interviews, five participants did not consent to recording of the interview or quoting them, so instead FF took notes and used these interviews to broadly further his understanding of the research questions and the interviewee's position in regard hereto. Also, potential interviewees in one government agency, two hospitals, two multilateral organisations and two academics did not respond or were unavailable. However, as seen in Table 8.1, our interview group for this study was overall well balanced, with 8 development partners, 9 government representatives, and 8 non-government representatives.

8.7. Conclusions and future research

While development lending has benefited the health sector in Senegal, the health sector should be protected from unprecedented public external debt servicing levels. This responsibility falls both on domestic policy makers, EDPs and the IMF. Enough flexibility should be made in repayment timelines to avoid the government having to consider cutting social sectors in order to make repayments. Exploring options for debt relief to address the rapidly growing debt burden of Senegal may become necessary, however our findings indicate that lower debt servicing levels do not equate increased health spending without political priority. Mechanisms such as debt-to-health swaps could be considered to ensure the health sector would benefit from any funds made available through debt relief [23]. This could also help level out the persistent and growing imbalance between the health and education sectors seen and prevent the health sector from losing out behind more economically profitable sectors.

In spite of increasing efforts and ambitions, non-binding targets under IMF/WB programs have failed to achieve adequate levels of GHE-S. While especially WB health financing policy has become more progressive over time and clearly supports GHE-S increases, impacts of past policies of cost recovery and hospital autonomisation seem to linger and shape the inequitable

payment patterns seen in Senegal. As long as economic growth and servicing its now historical debt levels are top priorities for the government to meet its obligations to the IFIs and other creditors before investing in the health sector, substantive real-term GHE-S gains and expansion of public-sector driven UHC expansion appear unlikely. To break this cycle, along with considering debt relief mechanisms, a legally binding agreement within existing broader fiscal and development frameworks between the Senegalese government, the IMF, WB and other partners could be considered to boost health spending toward internationally agreed upon targets such as the Abuja pledge of 15% of the government budget being allocated to the health sector (179), ideally from domestic revenue. Within the highly variable IMF social spending floors, sectoral floors for the health and education sectors of at least 10% of the government expenditure budget each, from domestic revenue, could be considered. If the Abuja pledge was to be taken seriously, it would be closer to 15% for the health sector, while a more pragmatic floor would lie somewhere in between. Country ownership and buy-in would be essential in this discussion, to avoid such policy changes becoming coercive. Such measures should hopefully allow for an expansion of well targeted state subsidy of health services through exemption schemes and CBHI premium coverage, or alternatively a move toward broader, integrated risk protection schemes and decreased emphasis on the private health sector with its reliance on co-payments and inequitable access patterns (172-174).

Future research avenues include exploring the lending and debt implications for the health sector in other countries using qualitative and mixed methods to understand individual country realities. Our framework and discussion of influence pathways could be used as a basis for this in other contexts, with modifications as necessary. Such case studies could focus on countries at high risk of or in debt distress, also exploring how implications of debt translate at different levels of the health system. Importantly though, keeping in mind the range of beneficial effects of concessional development lending, which had also benefited the health sector in Senegal, is essential for a nuanced and complete understanding of the health financing implications of development lending.

Another research pathway would be to model impacts of policy measures such as debt relief, debt-to-health swaps and setting health spending floors on health financing and service coverage. The proposed research should aim to identify the most effective development finance policy levers for expanding equitable health financing and making progress toward UHC.

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9. Chapter 9: Discussion

This PhD project aimed to investigate how External Development Partners (EDPs) and the International Monetary Fund (IMF) affect the mix of domestic health financing sources in recipient/borrower countries. The research objectives pursuing this aim are repeated here for clarity before discussing the study findings:

1. To investigate the relationships between development assistance, public external debt and IMF loan conditionalities and the levels and balance of Government Health Expenditure as a Source (GHE-S) and Out Of Pocket payments (OOP) among 105 Low- and Middle-Income Countries (LMICs) from 2005-2019 (Chapter 6).
2. To explore mechanisms of EDP influence on the mix of domestic health financing sources present in Senegal (Chapter 7).
3. To explore how external official lending, public external debt obligations and IMF/WB policy recommendations and loan conditionalities affect the mix of domestic health financing sources in Senegal (Chapter 8).
4. To develop recommendations for policy and for future research based on the study findings (Chapters 6, 7, 8 and 9)

This final chapter summarizes the main findings from these chapters. This first section of the chapter is organised around the three main health financing sources investigated: GHE-S, OOP and Voluntary Health Insurance (VHI).

The Discussion then discusses how the main findings contribute to the existing literature, identifies and discusses some key limitations present in the methods used, provides reflections on my own role and influence on the research process, findings and interpretation, and on alternative conceptual framings and methodological approaches to the explored research questions. The policy and research recommendations arising from this thesis are then provided jointly at the end of this chapter, before a final conclusion is presented.

9.1. Discussion of main findings

Figure 1 provides an overview of the integrated results from Chapters 6-8. The colour-coding shows which hypotheses were confirmed, rejected, or where more nuanced/mixed conclusions were reached. The different pathways of influence are discussed under the respective sub-sections for health financing sources below.

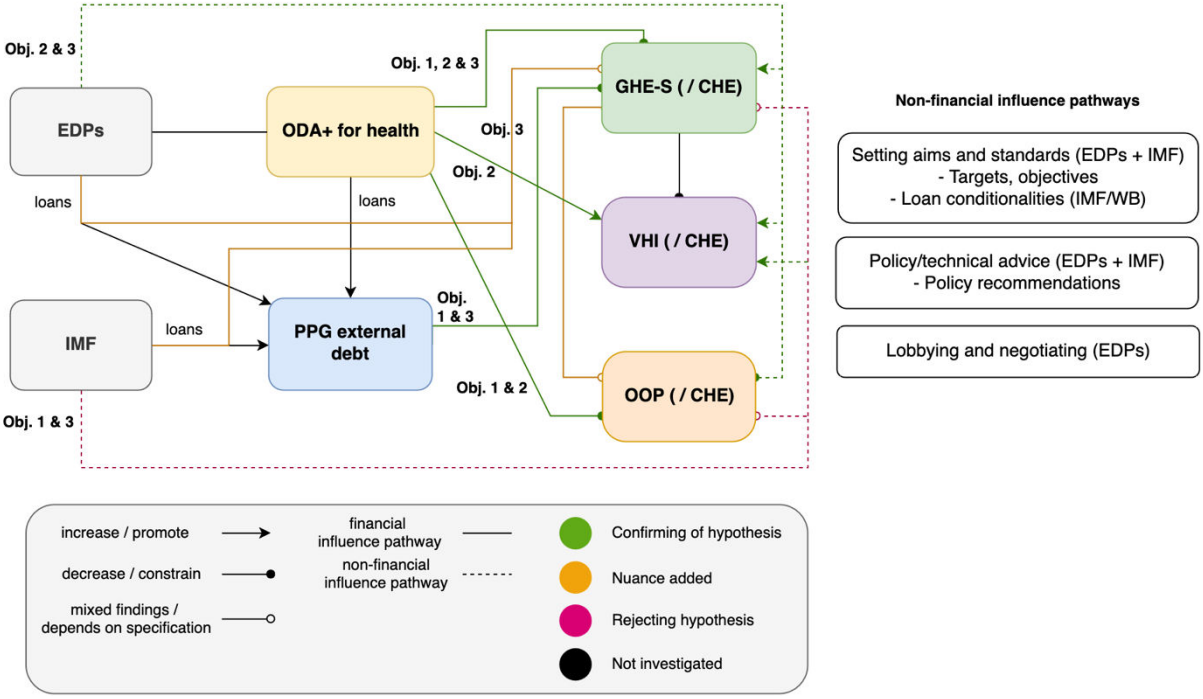

Figure 9.1: Integrated results from chapters 6-8. GHE-S / GDP correlated positively with OOP / GDP and negatively with OOP / CHE. GHE-S / CHE correlated negatively with OOP / CHE.

9.1.1. GHE-S

9.1.1.1. Official development assistance and GHE-S

This thesis mainly hypothesized a displacing effect of development assistance to the health sector on GHE-S (fungibility). A secondary alternative hypothesis of a synergistic co-financing effect was also proposed, i.e. that external injection of funds crowds in GHE-S, with much less overall support in the literature.

Chapter 6 found that, when channelled through the government, Official Development Assistance^{+} (ODA^{+}) for health was associated with reduced GHE-S, consistent with fungibility. Evidence of fungibility was also found at the country level in Chapter 7. The co-financing mechanism was employed by some EDPs in Senegal, however seemingly with limited overall effect on GHE-S.

These findings indicating fungibility of development assistance to the health sector align with the majority of the literature on the topic (1-15), in particular when channelled via the government (6, 7, 9, 10, 15).

EDPs should thus expect that governments will redistribute some of their own funds for health to other purposes when receiving on-budget external assistance for health. While EDPs may view this as undesirable, the role of recipient countries' ministries of finance is to distribute their budgets from all revenue sources to meet the needs across all sectors. Given that health is a sector with many partners, it is a predictable phenomenon that some domestic funds will be allocated to other sectors that receive less international attention.

9.1.1.2. Debt and GHE-S

In this thesis, it was hypothesized that external official lending from EDPs + IMF would work to support increases in GHE-S, but that the resulting debt obligations would constrain GHE-S. Chapter 8 found empirical support for both these relationships. Chapter 6 also confirmed that increases in Public and Publicly Guaranteed (PPG) external debt servicing led to decreases in GHE-S/Current Health Expenditure (CHE), though not per Gross Domestic Product (GDP) or per capita. The latter dampens the scope for policy inference, however the identification of the same effect on domestic government health spending in Senegal in Chapter 8 is encouraging in terms of the potential for drawing policy conclusions.

Chapter 8 specifically identified the influence pathway of external official lending working to expand the general government budget and thereby the overall fiscal space available for the health sector, as hypothesized. The temporal aspect of this effect likely works both within the immediate 0–1-year term when funds are received, and then on a much longer term as funds are invested and start generating economic activity and revenue for the government. During this longer term is also when any grace periods will run out and loans will start having to be repaid. These temporal considerations make policy inferences more complicated, because as the immediate effect of having to service an outstanding debt may be negative on part of the health sector, what are the benefits to the health sector today from development loans received 20 years ago? This consideration is included as a point of nuance in the policy recommendations at the end of this chapter.

Chapter 8 also identified the possible dynamic that spending cuts during the fiscal year to meet loan repayment timelines were more likely to occur in the health sector due to the presence of donors. This is similar but not equal to the fungibility mechanism. It points to a possible interaction between debt, development assistance for the health sector, and government health spending. If faced with debt repayment obligations, will a government cut where it expects that donors will cover costs? This question nuances the fungibility debate by adding the perspective that governments may reduce funding to a sector not as a mechanistic

response to having received external funds, but out of a future expectation of donor support where cuts are made.

Chapter 8 further identified how political economy factors such as sectoral visibility and profitability could become more prominent under budget constraint from debt obligations, driving government funds away from the health sector. It also showed how debt constraint seemed to affect the health sector more than the education sector due to political prioritisation.

Together, this leads to the following understanding: Indebted, aid-recipient governments first receive external official loans and grants, some of which will be ear-marked, which expand their budget along with all other revenue sources. From the available revenue, they allocate a proportion to debt servicing before making sectoral allocations. What they have left is allocated where it is politically and economically rational to do so, which may involve considerations of profitability and visibility of spending. The amount allocated to the health sector may also be determined by donor presence. During the financial year, debt repayment timelines, along with all other expenses incurred and pending during the year, may necessitate amendment of the government expenditure budget, where political priority as well as donor presence may again play a role in deciding where to make adjustments. These fiscal considerations and decisions result in the observed phenomena of fungibility and debt constraint of the health budget.

The findings for debt generally align with the majority of the identified econometric literature (11, 14, 16-20), finding constraining effects of debt on government health spending more often than not, and with available single-country reports from SSA also identifying this (21-23). No literature was identified studying the specific interactions between debt obligations, political prioritisations under budget constraint, and government health spending. The political prioritisation identified has variable support in the literature (24-27), with some authors finding more visible and profitable spending made during election years.

Our findings for aid, debt and GHE-S and those of the bulk of the existing literature are somewhat discouraging for EDPs, in the sense that their ODA for health may limit GHE-S due to financing fungibility, and their overall development lending may also help limit the degree to which health systems are funded by domestic government funds in the long term.

9.1.1.3. Non-financial influence mechanisms on GHE-S

This thesis hypothesized that EDPs would use their non-financial development cooperation activities to promote GHE-S, which was confirmed in Senegal. The IMF was hypothesized to promote austerity at the expense of GHE-S. In Senegal, the IMF was however found to have

the double-sided influence of promoting both revenue generation as well as increases in GHE-S, while at the same time limiting overall government spending to balance the fiscal deficit, with mechanisms in place to safeguard the health sector. Identified mechanisms of influence included aim- and standard setting, policy and technical advice/recommendations, lobbying and negotiating[40], and loan conditionalities.

Based on the reviewed literature, the identified influence mechanisms of technical advice and financing are well established mechanisms in the health policy literature (28-36), including for health financing reform (37-39). The external imposition of norms, aims and standards have been found in other contexts as well (40-44), while lobbying/negotiation has been less studied in a health policy context (45), possibly because it is harder to gauge as an outside researcher. These non-financial mechanisms generally promoted GHE-S and VHI and sought to reduce OOP, though for OOP only from the early 2000's after initial promotion under structural adjustment, the Bamako Initiative and hospital reform in the 1980's and 1990's. From the early 2000's onward, this had an opposite (positive) direction of effect on GHE-S in Senegal to those of the identified financial mechanisms of aid and debt, identified at both the country and global level.

A tension thus arises: On one hand EDPs tell governments to spend more on health, while on the other the provision of ODA for health leads to reduced GHE-S and as does the debt servicing obligations arising from loans, while development loans themselves can directly benefit the health sector and expand the revenue base underlying GHE-S.
In this balance it appears that the health sector in Senegal had lost out, receiving decreasing priority in the government budget over time (Chapter 8). This suggests stronger negative influences through fungibility, debt constraint and IMF austerity policies than positive influences from development loans and EDP+IMF promotion of increased GHE-S. However, the consistent increases in the budget for the education sector, suggest that government prioritisation may play a bigger role in determining government funding levels than external influences, as the education sector received high levels of aid and is also subject to an overall fiscal level debt constraint. However, it is unclear whether this would be the case in more fragile contexts with weaker governance.

[40] The results in Chapter 7 did not specifically identify the IMF using lobbying and negotiation, but this is likely a limitation/ omission, as the IMF by default negotiates with their member country governments when developing country programs.

In Chapter 6, no evidence was found for an influence on GHE-S from IMF programs or conditionalities at the global level. This may reflect, A: the double-sided mandate of the IMF in balancing the books, and B: complex individual country-level policy prescriptions being suboptimally captured in simple quantitative indicators across countries, as shown and discussed in Chapter 8. This negative finding at the global level aligned mostly with those of the IMF and its Independent Evaluation Office (46-50) (although with some exceptions (51)), and some previous research (52-54).

9.1.2. OOP

9.1.2.1. Official development assistance and OOP

ODA$^+$ for health was hypothesized to generally increase OOP/CHE through a main displacement effect on GHE-S, possibly counteracted by a direct effect of reducing OOP through covering health costs (OOP displacement/subsidy).

Chapter 6 found that OOP measured per GDP reduced with both on- and off-budget ODA$^+$ for health. No overall effect was however found on OOP/CHE (nor on GHE-S/CHE). EDPs were found to displace OOP/GDP about as much as they displaced GHE-S/GDP with their on-budget support for health, with a smaller displacing effect of their off-budget support for health added on top. Together, this indicates that EDPs serve as a source of revenue in the health sector, covering some costs for both the government and for users at the point of care, shifting the burden of payment onto themselves rather than shifting the balance between GHE-S and OOP. From an equity perspective, these are ameliorating findings, as it appears that EDPs apart from displacing/subsidising GHE-S also partially cover health expenses from the most inequitable source of financing in LMICs. The existing literature on this relationship was limited and divergent (4, 13, 14, 55-57).

9.1.2.2. Debt and OOP

Some limited evidence was found in the global level analysis of an increased reliance on OOP associated with public external debt servicing (Chapter 6).

The hypothesis was that an increase in OOP/CHE would occur through a decrease in GHE-S, which was seen, but only when measured per CHE, not per GDP. This is interpreted as public external debt servicing reducing the budget envelope for government health spending, resulting in a shift in the burden of payment toward the user. The magnitude of these effects may not have been identifiable relative to the underlying growth in GDP and population.
The existing literature is scarce, with one study finding respectively no significant relationship between general government debt per GDP and OOP (14), and others having found a negative relationship in Sub-Saharan Africa (SSA) (exact variables not reported) (18).

Overall, EDP non-financial influence mechanisms were found to decrease OOP in Senegal after 2000, and ODA+ for health was found to reduce OOP at the global level. However, public external debt servicing obligations increased reliance on OOP at the global level.

9.1.2.3. Non-financial influence mechanisms on OOP

The quantitative global analysis in Chapter 6 found no effect of IMF programmes or conditionalities on OOP. At the country level, we found evidence of EDP efforts to lower OOP, through setting aims and standards, as hypothesized (Chapter 7). WB policy recommendations and conditionalities also evolved from around the turn of the millennium to clearly seek to reduce OOP. However, their past promotion of OOP may have lingered in the payment patterns present in Senegal, and their ongoing recommendations and conditionalities to expand the role of the private sector in health service provision may also not be conducive to a transition away from OOP (Chapter 8).

The work in Senegal was consistent with the negative findings for IMF influence on OOP at the global level, in finding evidence of support for GHE-S and VHI while promoting reduced health expenditures for the poor, coupled on the other hand with general austerity measures on the public budget limiting the overall scope for an expansion of GHE-S and accompanying transition away from relying on OOP.

A historical evolution of WB policy from more traditionally neoliberal during the era of structural adjustment toward an increasing focus on pro-poor social policy has been identified by other authors (58, 59).

No other studies were identified investigating effects of IMF programmes or their conditionalities on reliance on OOP.

9.1.3. VHI

This thesis hypothesized that EDPs + IMF would directly promote Community-Based Health Insurance (CBHI) through aid and non-financial mechanisms as identified in the literature.

Chapters 7 and 8 found evidence of support for the expansion of *Mutuelles* in Senegal via EDP financing, policy/technical advice, and binding conditionalities from the WB. The initial disagreement around preferred models between EDPs seen in Chapter 7 highlighted the importance of donor coordination and alignment in this regard.

The general role of EDPs funding experimentation and scale up of alternative health financing schemes in LMICs, including CBHI, has been identified elsewhere (37-39, 60).

9.2. Main thesis contributions

Chapter 8 is the only empirical single-country case study of the impacts of debt on health financing identified outside of Kenya. In Kenya, a previous discussion paper has explored trends of public debt and health financing, while an Oxfam case study has used mixed-methods to explore debt impacts on the health sector including government health spending, both concluding a constraining effect (21, 23). By taking a mixed methods approach with new primary data generation in interviews combined with in-depth secondary data exploration in a new country context, we were able to significantly expand on the existing literature in particular in understanding pathways of influence and by providing a full view from initial lending over loan conditionalities to debt servicing obligations. Debt has typically been studied in fields outside of health, and the performed study highlights its relevance to both health policy and economics researchers. Using the case of the WB, the chapter went beyond existing case studies and econometric literature that tends to only look at the effects of debt in isolation from the prior influence of loans, and empirically established the essential point that loans may benefit the health sector in the first place. By showing how government education spending kept on growing in spite of debt obligations, it provided an original empirical basis for the interpretation that a constraining effect of debt on spending in a given social sector may be modified or even fully negated by political priority of that sector. These nuances are important in current and coming debates on debt relief and lead to policy recommendations as per Section 9.4.1.

Chapter 8 also provided the first dedicated, in-depth historical overview of IMF/WB policy recommendations and conditionality from a health financing perspective. In a field heavily dominated by panel data studies and desktop reviews, no other studies were identified that directly asked borrower country stakeholders of their experiences with how IMF/WB policy conditionalities affect the health sector in their country. With policy documents, the devil is often in the detail, and by critically examining these and asking key stakeholders what they have seen and experienced in Senegal, Chapter 8 uncovered, analysed and presented new and important knowledge. The evolution seen at the WB over time with increasingly progressive and equitable policy making, and the different efforts from the IMF to support and safeguard health and social spending – amidst austerity measures - adds moderation and nuance to an otherwise somewhat heated and polarised debate on the role of the IFIs in health financing.

The negative finding of no association between IMF programmes or conditionalities and OOP at the global level is the first identified attempt at exploring this relationship. Although the

finding of no association with GHE-S at the global level is not unique, Chapter 8 added insight on how these relationships are shaped by complex, multipronged policy recommendations and conditionalities at the country level.

The thesis made some important conceptual/analytical contributions. The frameworks generated in Chapters 7 and 8, integrated in Figure 9.1 in combination with the results from Chapter 6, provide a novel and comprehensive overview of the ways in which EDPs + IMF can influence the different domestic health financing sources in LMICs. This new conceptual knowledge should be relevant to a range of stakeholders from EDPs, the IMF, LMIC governments and civil society stakeholders in health financing.

The analytical framework derived in Chapter 7 in particular helped fill a literature gap between existing health financing policy analysis frameworks that do not specifically emphasize mechanisms of EDP policy influence, and the policy influence analysis frameworks from the broader development literature that do focus on mechanisms of influence but not specifically for health financing policy (45, 61-76). It forms a novel, re-usable analysis tool ready to be applied in other contexts for exploring the different pathways or mechanisms of EDP influence on different health financing sources, with any local contextual amendments as appropriate. The research recommendations for its real-world application are discussed in Chapter 7 and Section 9.4.2 below.

The literature on debt and health financing is still quite modest, and Chapter 6 expands a relatively small field of econometric studies on debt and government health spending (14, 16, 17, 19, 77, 78) and on debt and OOP (14, 18). Specifically, the negative relationships between PPG external debt servicing and GHE-S/CHE and positive with OOP/CHE are novel findings. They provide an important contribution to our understanding of the equity implications of public external debt servicing. The study used more robust econometric methods compared to much of the existing literature, adjusting for both disaggregated aid- and IMF-variables as appropriate as well as a large set of covariates, with an extensive battery of sensitivity and diagnostic testing.

Chapter 6 was the first study to compare the effects of both aid, debt and IMF variables on health financing in the same model. While the resulting significance patterns turned out with limit scope for comparing effect sizes between independent variables, these findings were still the product of a novel exploration that provides value in and of itself for other researchers seeking to model these relationships going forward.

Chapter 6 also used its strengthened estimation approach to identify a relationship between lagged ODA$^+$ for health per GDP, both on- and off-budget, and OOP/GDP at the global level. The particular model specification and robustness checking of this relationship has not been performed before, and the general relationship between development assistance for the health sector and OOP is rather scarcely studied in the existing literature, with diverging findings, and with some methodological issues as discussed in Chapter 6 (4, 13, 14, 55-57).

While the results for non-health ODA$^+$ produced in Chapter 6 were negative, they were a product of novel hypothesis testing and model specification, providing an early exploration of the potential displacement of government funds by sector-allocable ODA to non-health sectors to the benefit of the health sector.

The research in this thesis confirmed the presence of fungibility of on-budget development assistance to the health sector at the global level (1-15). It did so using more robust econometric methods than much of the existing literature as described above, for the first time adjusting for both non-health ODA$^+$, debt and IMF-variables. It also added a unique country level perspective in Chapter 7, with first-hand observations from key informants confirming this relationship and explaining underlying political considerations.

Chapter 5, published as a short communication in Global Health Action in 2022, provided a warning of the worrying trends in LMIC debt burdens and the risk of constraining public health sector financing, visualising how many countries spend more on debt servicing than health. The chapter set out a research agenda that has been partly addressed in Chapter 6 and 8, providing evidence in support of a constraining effect of debt on health financing in Senegal and at the global level in the form of shifting CHE payment patterns from GHE-S toward OOP. These findings thus provide added empirical justification for the published warning. The UN, WB, Center for Global Development (CGD) and The Lancet have since raised the alarm on this matter (79-82), and the short communication can thus, at a much humbler level, be seen as a small contribution to a growing global awareness of the potential social implications of unsustainable debt trajectories in many heavily indebted Global South countries.

9.3. Methodological limitations and reflections

9.3.1. General limitations

9.3.1.1. Measurement error

The thesis relied heavily on statistics from generally underresourced LMIC national statistical offices, which may face a series of financial, logistical and capacity constraints, limiting their

ability to produce precise and reliable data (83). International datasets from High Income Country (HIC) institutions should in principle suffer less from such constraints. However, even different international datasets estimating aid levels to Reproductive, Maternal, Neonatal and Child Health (RMNCH) based mainly on Organisation for Economic Cooperation and Development (OECD) data and reports from major multilateral organizations, have been shown to provide greatly varying estimates (84). However, the datasets used across the thesis are the best available and are widely used by other researchers, and with the range of sensitivity testing and data triangulation performed, its findings should remain valid.

9.3.2. Panel study limitations

In chapters 4 and 6, the issues of causal inference from observational data, endogeneity and confounding, selection bias and instrument proliferation were discussed, motivating the chosen estimator, model selection, and sensitivity testing. Some issues remain, as outlined in the following sections.

9.3.2.1. Subjectivity in panel data analysis

By conducting the analysis in Chapter 8, I have learned that econometric regression analysis using secondary, observational data, is not a fully objective science. The entire process from study design, data compilation, data cleaning, initial exploratory testing, model building and refining, final analysis, sensitivity testing, interpretation and discussion, are full of decisions. Every decision requires weighing up pros and cons, exploring alternatives and assessing the consequences of going down different paths, which involves an unavoidable degree of subjectivity. Leamer (1983) described this issue as follows:

"*All the concepts of traditional theory, utterly lose their meaning by the time an applied researcher pulls from the bramble of computer output the one thorn of a model he likes best, the one he chooses to portray as a rose*" (85).

Leamer recommended honesty about one's assumptions and the fragility of one's estimates through extensive sensitivity testing; conservative inference; and viewing inferences for what they are, namely opinions based on one's findings, not to be mistaken with facts (85). I have tried to the best of my ability to heed this advice throughout Chapter 6, Appendix 4 and this discussion chapter.

9.3.2.2. VHI as an outcome variable

Chapter 6 did not include VHI/Voluntary Health care Payment Schemes (VHPS) as an outcome variable. This choice was made for three main reasons. A: to limit hypothesis proliferation, which was already somewhat present with three sets of input variables of interest and two sets of outcome variables, along with covariates. B: Due to challenges in economic interpretation and inference. VHI/VHPS captures everything from CBHI for the rural poor to private health insurance for the urban rich. Increases in one country may thus reflect entirely

different changes in payment patterns, progressivity, pooling and cross-subsidy than in another country. C: VHI only forms 5% of CHE across LMICs, versus 45% from GHE-S and 34% from OOP (86). The approach for Chapter 6 to focus on the two major sources making up nearly 80% of health financing in LMICs was therefore preferred, to then focus on submitting the results for these to rigorous sensitivity testing.

The choice was therefore made to only delve into this matter at the country level, where the particular CBHI arrangement of *Mutuelles* could be understood and explored, with its specific terms, conditions and coverage. This does not mean that a panel data study of VHI would not be feasible, but its design, economic interpretations and policy inferences would need to be very careful. The choice made limits the findings for this financing source compared to the other two, but given the precarity of studying this variable with the used global-level panel data approach, this may not necessarily have been a limitation for this thesis in terms of its ability to produce valid and meaningful results and interpretations, rather than a higher number of results and interpretations.

9.3.2.3. Missing data

The approach to missing data was described in Chapters 4 and 6. Quality and validity issues were viewed as too substantial when more than 5 years were missing, corresponding to more than 33% of the data for a given country time series for a key variable of interest, and those countries were therefore removed. This choice was partly arbitrary by default, and a different threshold could have been chosen, however as explained in Chapter 4, the chosen threshold removed mainly small island nations and countries with severe conflict, where the capacity to collect national statistics may be challenged and there may be considerable risk of measurement error for any datapoints that were available. By analogous reasoning, the years years 2002-2004 were removed, because the OECD Creditor Reporting System (CRS) ODA data separated by channel of assistance was strongly fragmented for these years, with missing data for 28 to 131 countries for individual variables in a given year, a fragmentation that greatly improved in 2005.

While these choices came at the expense of statistical power and increased the risk of type II error, the findings in Chapter 6 are based on the higher quality data available, rather than all the data available, with the excluded part deemed likely to suffer from some internal validity issues.

An alternative approach would have been multiple imputation. There are many different approaches to this (87), however examples of the perils of doing so from the Development Assistance for Health (DAH) fungibility debate (15, 88), and the principal notion of artificially generating data, led me to avoid this course of action.

9.3.3. Case study limitations

The main limitations for the case study in Senegal are discussed in Chapter 7 and 8, while additional limitations are discussed in this section.

9.3.3.1. Alternative conceptual framings

9.3.3.1.1. Wider political economy factors

While Chapters 7 and 8 focused on external partner influence on health financing, a host of other political economy factors may co-determine health financing. As examples, government health expenditure has been positively associated with tax revenue (78), GDP (4), GDP per capita (78), aging of the population (78), democratic accountability (89) and government stability (89), and negatively associated with fiscal deficit (78) and corruption (89). While some of these factors were included as covariates in Chapter 6, and some political considerations were captured in Chapter 8, it was beyond the scope of Chapter 7 and 8 to fully lay out this web of co-determining factors in Senegal. It must therefore be kept in mind, that the case study in Senegal only captures a few dimensions of the political economy of health financing but not all, and the findings need to be held against those of others working on the political, social and economic determinants of health financing.

As discussed in Chapter 3, a number of different theoretical frameworks exist for analysing the political economy of health policymaking, however with few that capture the mechanisms or pathways of stakeholder influence, which was the focus of Chapter 7. The ones that most encapsulated influence mechanisms were used and adapted for that chapter, however alternative conceptual framings would have been conceivable, if the research questions were shifted to focus more for example on the policy process or on domestic political, social and economic factors.

A general challenge was that the research in this thesis was strongly question-driven (pragmatist), needing to generate novel analytical frameworks, while integrating and amending existing ones. It also had no well-established economic theories available in the existing literature to rely upon for exploring its research questions. An approach designing the research questions in direct alignment with existing conceptual frameworks and economic theories, ready to be applied, would likely have been easier. These were however the questions that I was and am passionate about, and I therefore chose the path necessary to address them, although more challenging. The resulting theoretical/conceptual contributions unpacking influence pathways can hopefully benefit other researchers going forward.

9.3.3.1.2. Framing influence mechanisms as power dynamics

An alternative framing that could also potentially have been feasible would have been a power framing, provided the associated necessary modifications to the research questions and methods were made.

Figure 9.2 shows a photo of the placement of the IMF resident representative office in the same building as the Ministry of Finance in Senegal at the time interviews were conducted. What is the extent and nature of exchanges that occur with this level of proximity to the most powerful ministry in the country?

Figure 9.2: Photo of the IMF resident representative office and Ministry of Finance in Senegal, December, 2019 (author's own photo).

External influence on domestic policy and finance is undoubtedly a question of power, and the identified influence mechanisms could alternatively be conceptualised as power dynamics. Both the Senegalese government and its EDPs were seen to exercise "agenda-setting" or "structural" power (90-92) - the government by setting out its national strategies, and EDPs by defining their own areas of interest and accompanying scope for support, which again are shaped by a range of national and political interests (e.g.(93-96)). Examples of "discursive" power from development partners were also seen, i.e. shaping the development discourse, and the ideation, understanding and interpretation of issues and solutions by stakeholders (90, 91, 97-100), and of course financial power (36). There are a number of different theoretical approaches to power analysis, including within health policy, e.g. (40, 91, 92, 101). Analyses of power dynamics in development cooperation including for health have been performed at the global level (102), for external donors and local governments (36, 103), at the project level (104), for North-South NGO collaborations (e.g. (105-107)), and regarding discursive power in international development cooperation (98), generally cementing the power and influence

of development partners and external NGOs. Applying this analytical lens to EDP influence on domestic health financing would be a potential area of future research.

9.3.3.2. *Uniform description of EDPs*

With the exception of clearly distinguishing between IMF and WB influence in Chapter 8, EDPs were otherwise generally described as one in Senegal, while of course mentioning individual EDP findings from the document review. This occurred as a result of the analysis in Chapter 7 showing no clear-cut delineations between the modality or direction of influence between individual EDPs, nor between bilaterals and multilaterals. Several interviewees gave the impression that this was due to a high degree of sovereignty, agency, and EDP alignment. This may well not be the case elsewhere, and in that case, the frameworks could be applied individually to different EDPs, which would help identify areas of mutual policy incoherence and poor EDP alignment.

An in-depth investigation into the lending agreements from bilateral creditors or other IFIs, might also have elicited different results. However, the international mandate of addressing fiscal and macroeconomic issues concerning balance of payments, inflation, fiscal deficit, debt distress and more rests with the IMF, supported by the WB. Requirements for a comprehensive national development strategy within an externally derived framework as e.g. a Poverty Reduction Strategy Paper (PRSP) is also a unique phenomenon from the WB, and studies of many other creditors than the IMF/WB could potentially yield results showing a narrower scope for external influence contained within the identified influence mechanisms. The main exemption from this general remark would likely be France, which has a long and extensive history of development cooperation with Senegal due to their colonial legacy, and further in-depth studies into influence from country creditor lending agreements could start with France.

9.3.3.3. *Interview limitations*

Interviewer bias inevitably affected this part of the research (108). There naturally was an asymmetrical power relationship between me as the researcher who set the scene and dictated the topics to be discussed, and the contents of the questions were in one way or another colored by my preconceived notions and hypotheses for these topics (108). The main way I attempted to mitigate this was through reflexivity (Section 9.3.4), i.e. reflecting on the relationship between me as an interviewer and the interviewee and the personal biases I brought to interviews. The loose structure of the semi-structured interviews did however allow the interviewee to take control for parts of the interview, which was often the case and helped mitigate the asymmetry in my relationship with the interviewee.

My French was both somewhat limited and rusty upon arriving in Senegal. I therefore completed a 6-week course in intermediate French (B1-B2 level) aimed at preparing participants for studies at university level in France, and I immersed myself as much as possible in the language while in Senegal. After a few months, I became proficient enough to conduct interviews on my own without an interpreter. Throughout interviews, both with and without an interpreter, certain nuances may however have been lost in translation. Everything said in French by participants was however transcribed in French by my transcriptionist, so I have been able to analyse the original words of my participants 1:1. That said, some Senegalese interviewees could still have been more comfortable in Wolof.

The fact that I am white and foreign were also unchangeable limitations to my ability to build trust and report with Senegalese participants, who might possibly have provided more reserved responses to me than to a Senegalese researcher. The reliance on an interpreter for most interviews further reinforced this position as an outsider and led to a more formulaic interview style. Additionally, there may have been linguistic and cultural nuances that I have not been attuned to, that could have carried over to the analysis and interpretation stage as well.

9.3.3.4. External validity

The external validity of findings in the case study is limited when it comes to relationships, policies and events specific to Senegal. Findings of a more principal nature, such as the mechanisms of EDP influence, the general policy positions of the IMF and EDPs present in Senegal, the impacts of a large debt burden, and the challenge in reducing OOP and progressing toward UHC, should however remain pertinent in other contexts. By attempting to inductively look for rather high-level, principal dynamics present in Senegal and use the observations made to generate analytical frameworks and conceptualisations of the dynamics in question, the scope for using the findings to explore similar dynamics in other contexts should hopefully have been expanded.

One factor that improves the applicability of the case study findings to other contexts is the fact that the interviewed external stakeholders are present across many LMICs, including in SSA, and other countries may have had similar experiences with these organizations. By anonymising interviews, this factor has however been attenuated, but it was done out of a primary concern with protecting the confidentiality of study participants.

9.3.3.5. Changing political context in Senegal

Sadly, the regional beacon of political stability I conducted interviews in in 2019/20 temporarily destabilised. Following a series of corruption scandals, arrests of political opponents and

banning of their parties, ex-president Macky Sall attempted to run for a third term against the two-term presidency constitutional limit, triggering a constitutional crisis in 2023/24 (109-111). Violent protests erupted resulting in the deaths of at least 60 demonstrators (110, 112). Twenty days after being released from prison, opposition candidate Diomaye Faye was elected president on April 2, 2024 (111), after which conditions have been more stable. At the time of interviews and ensuing document and quantitative review and analysis, political conditions were much more stable. The interpretation that the case study findings reflect EDP-government interactions under political stability should therefore hold, and the temporary political instability in Senegal should not have affected the validity or relevance of the case study findings.

9.3.4. Reflexivity

Every person is shaped by their socio-historical position, and as can no social scientist claim to be removed from their subject matter and bias-free (113). My positionality as a Western, middle-class, cis-gendered, heterosexual, white male in good health from the stable and rich welfare country of Denmark, has led to a range of privileges throughout the course of my life, including the opportunity to pursue this PhD. How this positionality led to interview limitations in Senegal, being an outsider or "etic" (113, 114), has been discussed above in Section 9.3.3.3. My positionality meant that I came to Senegal embodying historical and present systems of exploitation and injustice, asking high-level key stakeholders to give me their time and information for free. Undeservingly, people generally opened their doors for me, and I owe a debt of gratitude to interview participants for not outright rejecting me.

In terms of my overall approach to the general research topic, in my particular case, a self-awareness of my privileged positionality has motivated an ongoing journey of learning, critical self-reflection and importantly exposure and immersion in other cultures and social contexts. My clinical work in a number of different settings in different parts of the world has shown me, first-hand, the human consequences of social and economic inequities, from cradle to grave. These experiences have led to a lasting engagement in issues of social justice and social equity. This may have led to a partiality in my hypothesis generation, study design and execution, *a priori* favouring a view of the beneficiary country as a "victim" of Western wrongdoings, perhaps out of feelings of guilt, moral injustice and resulting indignation. This may have rendered me less attuned to evidence of alternative explanations of findings on the part of beneficiary countries, such as political and institutional inefficiency, self-serving or inequitable political prioritisations, corruption, etc. I tried to mitigate this bias in my interviews by attempting to give each interviewee equally "firm" treatment, asking probing questions to elicit the reasoning behind their positions and pursuing statements needing further

justification. For the panel study, I made sure to include a comprehensive set of control variables to capture alternative explanations of observed trends, including governance and corruption factors. I leave this PhD with a more nuanced world-view, now seeing more shades of grey, where it was more black and white when I started.

In interview studies, where data is generated as a dialogue, reflexivity is an essential part of being able to maintain a certain level of scientificity. Being aware of this, I tried to prepare myself better for interviews by conducting a mock interview to receive critical feedback both on the content of my questions but also on how I came across, my style of enquiry etc. After each of the interviews, I would reflect on questions that had not gone as intended, situations where the interviewee and I had misunderstood each other, my degree of probing for further information, whether my questions were perceived as sensitive, the general report between the interviewee and I, and more. I would also ask my interpreter for feedback on my interview style and cultural awareness.

Epistemologically, I have experienced a personal development from more positivist at the beginning of the research process, in part due to having a background in medicine and public health with emphasis on quantitative subjects, towards much more pragmatist. This has allowed me to see the strengths and limitations of different methodologies more clearly and understand the value of letting the core research problem drive one's choice of methods.

Finally, conducting PhD studies as a father of first one, then two, now three, while being self-funded for the last year of my studies, has been challenging. It has taught me the value and necessity of strict time management and developing and maintaining an efficient work process. I can only thank my wife for having made the daily sacrifices, in particular during the last year, to allow me to give undivided attention and immerse myself fully in the research and writing process.

9.3.5. How Covid-19 affected the research

I was personally fortunate enough to have completed the interviews in Senegal just before the Covid-19 pandemic. The research process was therefore not impacted. However, my overall study subject was dramatically affected. Both ODA, development assistance for the health sector and GHE-S levels spiked (86, 115), a global financial recession unfolded (116), and debt service suspension was offered to many countries by the IMF and WB (117). However, the research questions were at a relatively high level, in a long time perspective, the interview data was collected before Covid-19, and the last year of our panel study is 2019. I was

therefore able to pursue the research more or less as intended, while discussing the impacts of Covid-19 on the financial indicators of interest in the papers where this was relevant.

9.4. Recommendations

9.4.1. Policy recommendations

9.4.1.1. Displacement of GHE-S and OOP by development assistance

Chapter 7 showed how the co-financing mechanism is an available policy tool for counteracting displacement of domestic government health spending when disbursing on-budget ODA$^+$ for health. However, government redistribution decisions can arguably be considered as rational, sovereign decision making under budget constraint (118, 119) - as long as funds retain some kind of social/development purpose. Co-financing requirements might run counter to the idea of country ownership. Aid fungibility/displacement might also be an issue in one country but not in another. As such, any use of co-financing requirements to avert aid displacement needs to be used A: in a tailored, individual country manner, B: with strong reference to the Paris and Accra principles for development cooperation (120), and C: with the broader fiscal budget dynamics upon receiving ODA in mind, which could in principle benefit the health sector in a given country, although this was not confirmed at the global level.

Importantly, EDPs were also found to subsidise/displace OOP with their ODA$^+$ for health, both on- and off-budget. This should soften the debate on fungibility: While EDPs to some extent subsidise GHE-S, they also seem to subsidise OOP, in Chapter 6 with comparable effect sizes. The latter is in direct support of UHC and should be an encouraging finding for EDPs in health.

9.4.1.2. Debt relief

The evidence provided at the global level for public external debt servicing shifting the composition of CHE (though no significant association between debt servicing and GHE-S/GDP was found) (Chapter 6), the findings that debt appeared to constrain government health spending in Senegal (Chapter 8), contextualised by the available literature linking increased debt servicing to decreased health spending, warrant the following recommendation.

In some countries, particularly the more indebted such as Senegal, it may be necessary to address the country's debt burden to generate the necessary fiscal space for health to make progress toward UHC, provided governments prioritise freed up funds to the health sector. The findings in this thesis do not support a general interpretation and recommendation that all external debt is bad for the health sector. Rather, to help generate the necessary fiscal space

for health, discussions and solutions to a country's debt burden may need to happen on a case-by-case basis, which could start with the most indebted countries. This is based on the assumption that the effects identified in Senegal may be worse in countries that are more indebted, an assumption that likely depends on a number of political and economic factors and may well not apply in countries that successfully manage to insulate their health sectors from the fiscal impacts of debt repayment obligations. Being able to do so could partly depend on the flexibility of debt repayment timelines, and a role for international creditors could be to make loan repayment timelines more flexible to avoid sensitive budget cuts during the financial year.

The findings in this thesis do not provide grounds for any broad recommendations in terms of choosing between alternative mechanisms for addressing countries' debt burdens where needed, but they do support the interpretation that doing so may help enable a shift toward increased GHE-S and in turn less reliance on OOP, if the health sector is prioritised by the government. Generally speaking, relief of a country's debt burden can be instituted through a variety of mechanisms including debt restructuring, debt cancellation, debt-to-health swaps, expansion of concessional lending to repay more expensive loans and reduce the need for new ones, and more (121, 122). There are different lines of thought about these different alternatives, some advocating debt cancellation from a justice and anticolonial perspective (123, 124), others praising the benefits of debt-to-health swaps as has been facilitated e.g. by the Global Fund to fight Aids, Tuberculosis and Malaria (GFATM), where freed up funds from bilateral debt cancellation are channelled via their organisation to their designated purposes (125, 126). In 2020, the Covid-19 pandemic led to the institution of the G20 Debt Service Suspension Initiative, temporarily pausing debt servicing requirements to help countries cope with the Covid-19 pandemic. This was followed by The G20 Common Framework for Debt Treatments, intended to serve a longer term function of helping restructure the debts for countries facing insolvency and protracted liquidity issues (127). This scheme has been heavily criticised for not providing any debt relief nearly four years after its establishment, for example by the chief economist at the World Bank, Indermit Gill (128). With debt burdens growing, this debate is intensifying, and the lack of agreement reflects entrenched interests on all sides: Bilateral creditor governments, multilateral creditor institutions, private creditors and borrower governments. Eventually, debt servicing levels in many countries have reached or will reach Heavily Indebted Poor Countries (HIPC)/ Multilateral Debt Relief Initiative (MDRI)-levels, and resolution will be needed again. The case study of Senegal showed how HIPC debt relief did not clearly lead to increases in GHE-S, and that government education spending could continue to grow in spite of debt pressures, while government health spending showed periods of stagnation and received decreasing budget priority over time. In the case of

Senegal, this points to debt-to-health swaps as an important policy tool to ensure the health sector benefits, if the country's debt sustainability worsens over time and debt relief is to be considered. To what extent this recommendation can be extrapolated to other countries, would have to rely on the specific national development agenda and the budget priority given to different sectors. An equity principle would target debt-swaps toward the social and environmental sectors most in need.

Chapter 8 also identified the positive mechanism for government health spending arising from having received external official loans in the first place. The downstream positive effects for the health sector of such loans years later are much harder to quantify but need to be kept in mind as a tempering consideration when debating the present-day issues associated with debt obligations. Importantly, the negative debt implications discussed in this thesis are also expected to be proportional to the degree of concessionality of a loan. The more concessional lending EDPs can make available, the less likely governments are to resort to borrowing money on non-concessional terms, and the less likely negative debt implications are to be seen.

9.4.1.3. Dedicated IMF health spending floor

The finding of arbitrarity and inadequacy of an overall social spending floor in Chapter 8, led to the consideration of the option of a separate spending floor for the health sector instituted by the IMF, in Senegal and potentially elsewhere. If the Abuja target was to be taken seriously, this would be at 15% of General Government Expenditure (GGE). A more pragmatic and incrementalist recommendation would be at 10 or 12% of GGE. In Senegal's case, this would constitute a large expansion of GHE-S, but would still be nowhere near existing targets such as the Chatham House goal set by Di Mcintyre and Filip Meheus of 5% of GDP to make progress towards UHC (86, 129, 130), or their US$86 per capita target just to provide core primary health care services in LICs (131). Country ownership and buy-in would be essential for the success and viability of a designated health spending floor. To avoid health exceptionalism, it could be combined with a floor on education spending. Starting both at 10% each could be a politically viable starting point.

The IMF could further consider offering improved terms of lending for countries spending more on health, education, the environment and other social purposes. This would incentivise and reward increased social spending, rather than the current practice of a general, non-binding floor on social spending, which has been found to often act more as ceilings on the ambitions of governments, rather than incentives for increased spending (132).

9.4.1.4. Policy recommendations in Senegal

A key policy recommendation for the Senegalese government arises from the following observations in this thesis. A: GHE-S in Senegal has increased very modestly and at times stagnated since 2000. B: GHE-S/General Government Expenditure (GGE) has steadily declined. C: GGE has grown substantially, more than five-doubling in real terms between 2000-2022 (133, 134). D: government spending on education has grown strongly, in spite of any constraining effects from debt on fiscal space or IMF austerity prescriptions. E: EDPs, including the WB, plus the IMF, have promoted increases in GHE-S. Viewed together, and as supported by key informant observations, the logical conclusion is that the government has not given sufficient budget priority to the health sector. The policy recommendation that follows is that the political decision needs to be made to increase the real-term health expenditure budget substantially to meet population needs, honouring the Abuja declaration and Senegal's past and present national health sectoral development strategies and supported by its EDPs. In light of domestic and externally derived non-binding targets having been largely ineffective, a legally binding agreement within existing broader fiscal and development frameworks between the Senegalese government, the IMF, WB and other partners could be considered to boost health spending toward internationally agreed upon targets such as the Abuja pledge (135), ideally from domestic revenue. This would transcend changing governments, priorities and economic circumstance, and ensure that 10-15% of the Senegalese expenditure budget was earmarked to the health sector, providing sustainable and reliable financing for the health sector. Hopefully this would translate into increases in GHE-S/CHE and corresponding decreases in VHI and OOP per CHE, with ensuing improvements to progressivity in the mix of domestic health financing sources and health service access for poor and vulnerable groups. National ownership and motivation would be essential for a such process to avoid being tainted by elements of coercion.

The latest Senegalese government expenditure budget for 2024 allocated 4.6% to the Ministry of Health and Social Action, 10.0% to debt servicing, 5.4% to military spending, 5.5% to the energy sector, of which 3.8 percentage points were allocated to fossil fuels, and 22.7% across three education, training and university/research ministries (136). Addressing the debt servicing share through debt relief and debt-to-health swap mechanisms has been discussed above. Ministerial spending on military and fossil fuels making up twice the amount of health spending invites the question of whether some redistribution from these areas could occur. It is not tempting to recommend a redistribution from education to health, but at present, there is a factor 5 between the budgets of Senegal's three education-related ministries and the Ministry of Health and Social Action. Perhaps the imbalance observed in this particular case invites for this, otherwise uncomfortable, recommendation.

As for the EDPs in Senegal, the conflict seen around decentralised versus departmental-level CBHI has not been conducive to progress in Senegal's ongoing journey toward UHC. The high degree of health financing scheme proliferation and fragmentation seen in Senegal, combined with decentralized CBHI pools, speaks for a need for integration (137). EDPs should show their ongoing support for scheme integration, steered by equity principles of progressive revenue raising, large pools, and cross-subsidy from rich to poor (138). The ongoing integration efforts for departmental-level CBHI align with such principles, and from an equity perspective, EDPs should harmonize and align behind this goal. Further UHC expansion beyond this may likely necessitate a larger government health budget as discussed above, and EDP promotion of this should continue.

9.4.2. Recommendations for future research

A number of different avenues for future research can be identified from the work in the individual chapters and jointly from the thesis as a whole, as outlined in the following sections.

9.4.2.1. Extending and adapting analytical frameworks and regression models

A high degree of EDP alignment with clearly formulated government policy was found in Senegal, leading to the uniform application of the analytical framework in Chapter 7. In contexts with poorer governance, donor coordination and alignment, the framework could however be applied individually across multiple EDPs in a country. This would allow one to map out health financing policy incoherence, separated by EDP and by mechanism. This greater granularity might help increase the specificity and utility of resulting policy recommendations as pertaining to individual EDPs. Next steps could also be to integrate political economy co-factors, following e.g. conceptual frameworks by Sparkes et al. (75) or Fox and Reich (2015) (45, 76). While analytically more extensive and complex, it would help identify interactions between local political, social and economic factors, the government and EDPs, allowing for an even more comprehensive understanding of the web of determining factors in domestic health financing policy. One could also integrate the "3-i's" (66) analogous to (45), exploring the motivations for why a given EDP influence is seen.

Attempts at reproduction of existing econometric studies have been very rare in the examined literature, only for a few panel data studies. Reproduction of the panel data study in this thesis to test and challenge the validity of its findings would be warmly welcomed, and the underlying data will be made available upon request.

Specific extensions of the econometric study could include a deeper exploration of the mirror-hypothesis to fungibility, namely the displacement by non-health ODA of domestic government

funds from non-health sectors toward the health sector. Questions of government prioritisations under budget constraint from debt servicing obligations could also be further investigated in a set of regression models with sectoral allocations each per GGE as dependent variables, and PPG external debt servicing (or general government debt servicing) as the main independent variable. This would empirically explore which sectors are most affected by debt obligations at the global level.

9.4.2.2. More country case studies of debt impacts on health sector financing

As discussed in Chapters 3 and 8 and Section 9.2 in this chapter, only two reports from Kenya were identified that sought to empirically investigate the impacts of debt on government health spending at the single-country level. As discussed in Chapters 5, 6 and 8, with debt burdens growing across LMICs, more country-level studies are strongly needed to understand fiscal consequences, what these mean for health system financing, equity and population and individual-level health service provision. For countries that have managed to insulate their health spending from debt obligations, what are the explanatory factors that have allowed them to do so, and what lessons can be learned from this for other indebted LMICs, and for the IFIs? Studies of these different relationships could start with the most heavily indebted countries. As an alternative to the in-depth single country lens, they could consist of surveys of a set of heavily indebted countries, at the expense of some contextual depth.

9.4.2.3. Modelling debt relief effects on social spending

As governments, development agencies, International Financial Institutions (IFIs), civil society and populations look for solutions to the looming debt crises in many LMICs, an important role for researchers could be to simulate different policy options. Systematically modelling different debt relief scenarios under a number of transparent assumptions, in particular about how much of relieved debt is allocated to health spending (which could be pre-determined in debt-to-health swaps) could help inform decision-making to optimise social benefits and make these more tangible to decisions-makers. They could be combined with modelling of domestic climate funding gains, domestic education funding gains etc., which could all be linked to potential impacts on relevant Sustainable Development Goals (SDG) indicators. This type of study would benefit from an improved empirical understanding of under which circumstances, debt relief translates into increased social spending. Statistically, this would be a question of either effect modification or disaggregated analysis by the political and economic variables deemed to determine differential policy responses to debt relief.

9.4.2.4. Effects of private lending on government health spending in LMICs

This research focused on the roles of external official creditors, i.e. bilateral and multilateral lenders representing single or multiple nation states, however, as seen in Senegal, private lenders were playing an increasing role. The 2023 WB international debt report found among

International Development Association (IDA)-eligible countries that 21% of long-term PPG external debt was owed to private creditors in 2022 compared to 10% in 2012 (80). In 2022, when high inflation rates led to tight monetary policy in HICs increasing the cost of borrowing, private bondholders sold their bonds in LMICs and bought in HICs at higher interest rates, causing the repayment of US$127 billion from LMIC governments to private bondholders (80). Together with outflows to banks and other private creditors, LMICs ended up paying a total US$185 billion more as principal repayments to private creditors than they received from them in loans in 2022 (80). These macroeconomic fluctuations illustrate the volatility of private financing, that are bound to have some level of impact during the fiscal year among borrower governments. There are additional moral issues around wealthy, private entities owning the debt of governments with limited resources, as exemplified by the case of BlackRock, the world's largest asset manager, owning 7% of Zambia's government bonds and demanding repayment in full while the country is in a debt crisis (139-141).

When different foreign investment companies own the debt of struggling LMIC governments, debt suspension and restructuring processes are also rendered more challenging than is already the case for an official multilateral debt restructuring process. Multilateral creditors such as the IMF and WB at times end up having to effectively bail out private creditors, issuing new loans to repay old ones (142). Research into and reports of these issues and their social sector impacts have until recently been somewhat confined to civil society (e.g. (23, 143-145)), though with some recent attention from the UN (146). The social and health impacts of private lending to LMIC governments should be the subject of academic investigation. Such research would have high policy relevance in building an understanding of the workings and human consequences of a looming Global South debt crisis (146), and could hopefully even help inform a way out of it.

9.4.2.5. Future research in Senegal

The finding that the Senegalese education budget increased steadily over the past two decades while health budget growth was more limited and at times absent, invites for an exploration of the underlying causes of this discrepancy through a broad political economy lens. Similar methods as the ones used for the case study in this thesis could be used to pursue this question, however a broader framing bringing in more contextual determinants might elicit a more comprehensive understanding of the different drivers.

Further in-depth studies into external influences on domestic health financing from other country creditor lending agreements could also be conducted, beginning with France due to their historically influential position in Senegal.

9.4.2.6. Alternative methodological approaches

9.4.2.6.1. Complex systems modelling

By focusing on mapping mechanisms of effect and evaluating a number of determining variables in regression models, an emergent finding of the research is the complexity of the relationships between EDP+IMF activities, recipient governments, and health financing, between EDPs themselves, and the host of political economy factors that co-determine the central dynamics investigated. In realising and acknowledging this complexity, a complex systems modelling approach to the same or similar research questions appears as a natural extension of the work. Mapping the entire political economy of the health financing sources in a country for instance, including contextual factors, stakeholders, influence pathways with directions of effect (and sizes if possible), and feedback loops, would likely provide a more exhaustive representation. Its policy utility might however be challenged by its sheer complexity, and some degree of balance between complexity and utility would likely need to be sought.

9.5. Conclusion

The evidence provided in this thesis has shown how external financing both for health and non-health purposes is not a neutral injection of funds without domestic repercussions, but rather financing flows that trigger a number of fiscal and macroeconomic dynamics both arising from the financing itself, and from the non-financial exchanges and requirements that follow. This set of relationships help co-determine, along with a range of political and socioeconomic cofactors, to what degree a recipient country relies on pooled and prepaid sources of financing such as government health expenditures, different health insurance mechanisms, or unpooled user fees paid at the point of care. Effects can be delayed and can last over time, stemming from past policy influence. The direction of effect can vary between EDPs and change over time as EDP policies evolve, which could give rise to health financing policy incoherence. These relationships expectedly differ between countries, some may not be present or may not be identifiable at the global level, while they may be deeply influential at the single-country level. Methodologically, the thesis has illustrated how global level observational studies are useful for gaining a broad macro-level understanding of a research question and testing principal economic hypotheses, and how a country-level, case-by-case approach is necessary to be able to make specific observations and inferences, and better justified policy recommendations applicable at the country level.

In Senegal, EDPs have generally supported an expansion of more progressive domestic health financing, promoting the expansion of GHE-S and exemption schemes, SHI and VHI,

and seeking to reduce OOP. Debt obligations, WB promotion of the role of the private health sector, austerity measures from the IMF, past structural adjustment policies promoting user fees and hospital autonomisation, as well as inadequate political priority of the health budget, have been limiting factors in Senegal's journey toward UHC. Supported by its partners, expansion of GHE-S and integration of health financing schemes including consolidation of CBHI will be important steps to increase financial risk sharing and cross subsidy in Senegal.

Finally, the growing indebtedness of many LMICs is worrisome, and debt resolution may be necessary for countries at high risk of or in debt distress. However as illustrated by the case of Senegal, creating fiscal space does not by default translate into increased health spending, and bilateral and multilateral agreements, such as debt-to-health swaps, may be necessary to ensure the health sector benefits from increased fiscal space.

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10. Appendices

10.1. Appendix 1: Literature review methods and detailed literature summaries

10.1.1. Literature review methods

The literature collected in this thesis is the product of a series of literature reviews conducted at the different stages of the research. A formal, systematic literature review was performed during the initial design of the study in 2018 as described below. Over the course of the study, two purposive document reviews were conducted for Chapters 7 and 8, and ad hoc background literature reviews for Chapters 5-8. A final updated literature review was then conducted when writing up the thesis.

The initial systematic literature review in 2018 involved the following methods. Econlit, Medline, Embase and Global Health databases were searched for relevant English language literature describing relationships between development assistance for health, debt and loan conditionalities on one side and different sources of financing for health on the other - government health expenditure, OOP and voluntary health financing contributions. No time period constraints were applied to this search. The different search strings applied are presented in Table 10.1. Studies were included for review if the title or abstract mentioned any of these dynamics and excluded if any of these were not a focus of the full-text article. Article references were also reviewed for further relevant literature, some articles were referred from supervisors, and Google was also searched ad hoc for grey literature.

Database(s)	Search String	Results after duplicate removal	Of which relevant
Development Assistance for Health and Government Health Expenditure			
Medline, Embase, Global Health, Econlit	(DAH or "development assistance" or fungibility or displacement) and ((government$ or public or domestic) adj2 (expenditure$ or spending or financ$ or investment$)) and health	161	21
Development Assistance for Health and Out Of Pocket Expenditures			
Medline, Embase, Global Health, Econlit	(DAH or "development assistance" or fungibility or displacement) and ("out-of-pocket" or OOP or OPP or "out of pocket") and health	307	0
Development Assistance for Health and Voluntary Health care Payment Schemes			
Medline, Embase, Global Health, Econlit	(DAH or "development assistance") and (((voluntary or private or pool$) adj3 (expenditure$ or spending or financ$ or contribution$ or fund$)) or (insurance or prepaid)) and health	22	0
Public External Debt and Government Health Expenditure			
Medline, Embase, Global Health, Econlit	((public$ or PPG or government$) and (debt or loan$ or lending)) and (("government" or public or domestic) adj1 health adj1 (spending or expenditure$) or GHE or TGHE or GHE-$ or $GGHE$)	19	4
Public External Debt and Out Of Pocket Expenditures			
Medline, Embase, Global Health, Econlit	"(public$ or PPG or government$) and (debt or loan$ or lending) and (OOP or $pocket$))"	91	0
Google Scholar	1: Same as above. 2: ("external public debt" OR "public external debt" OR "PPG debt" OR "PPG external debt" OR "external PPG debt") AND ("out-of-pocket" OR OOP OR OPP OR "out of pocket")	1: 141 2: 89	1: 0 2: 0
Public External Debt and Voluntary Health care Payment Schemes			
Medline, Embase, Global Health, Econlit	"(public$ or PPG or government$) and (debt or loan$ or lending) and (((voluntary or private or pool$) adj3 (expenditure$ or spending or financ$ or contribution$ or fund$)) or (insurance or prepaid)) and health"	295	0
Senegal's aid and debt history			
Medline, Embase, Global Health, Econlit	Senegal and (DAH or "development assistance" or "foreign aid" or debt or loan$ or lending or "structural adjustment" or SAP or SAF or "poverty reduction" or PRSP or PRGF or "heavily indebted" or HIPC or MDRI	118	1

Table 10.1: Search strategies applied at the design stage of the research in 2018.

Slightly modified versions of the above search strings in Table 10.1 were run again on PubMed and Econlit between April 5-9, 2024, for 2018 and onward, to capture any new relevant literature missed in the preceding reviews. A new search string was also added[41] homing more

[41] ("development partner" or "development partners" or EDP or EDPs or "financial partner" or "financial partners" or TFP or TFPs or donor or creditor* or lender*) and (impact* or influence* or effect* or affect* or power* or determin*) and health and (financ* or fund* or contribut* or expenditur* or spending* or OOP or "out-of-pocket" or "out of pocket") NOT (transplant* or transfus* or blood* or milk* or methyl* or tissue* or heart* or cardiac* or eyes* or kidney* or liver* or eggs* or oocyte* or teeth* or cancer* or syndrom* or neuro* or metabol* or molecul* or serol* or microbio* or nutrit* or biotech* or vaccin* or workforc* or nurs*)

directly in on EDP influence on domestic health financing contributions, and one[42] on IMF/WB's influence on the same, both without time limitations. This added 3402 new records, where titles and abstracts were screened for potential relevance to the research questions, identifying 60 additional papers for full-text review. References were also reviewed to identify more relevant papers. Papers that directly pertained to the research questions were integrated into the corresponding sections of Chapter 3.

To be able to create the analytical framework used in Chapter 7, a review of the literature on existing frameworks for analysing development partner influence was performed. This review was performed using the LSHTM Discover platform, which cross-searches a range of different databases, as well as Google Scholar, using combinations of keywords such as development, partner, assistance, framework, theoretical, conceptual, influence, impact, health financing and more. Frameworks cited in identified papers were also reviewed. This literature is described in the corresponding section in Chapter 3.

The two purposive document reviews in Chapters 7 and 8 were part of the research methods, and the relevant identified literature is described in the results and discussion sections of those chapters, while the purposive document review methods are described in the methods chapter of this thesis and Chapters 7 and 8.

Literature on HICs was excluded from all the searches as the research questions pertained to LMICs, and HICs do not have external development partners in the traditional sense of the term, nor do they receive ODA.

10.1.2. Multi-country panel data studies of associations between development assistance for the health sector and government health expenditure

Table 10.2 summarises the identified studies of associations between development assistance for the health sector and government health expenditure:

Study	Time span	No. of countries	Development assistance for health sector data source	GHE data source	Main method of estimation	GHE change from $1 increase in development assistance for the health sector
Mishra and Newhouse (2009) (1)	1985-2004	118	OECD CRS	IMF (*GHE-S/A not stated*)	OLS	+$1.50

[42] (IMF or "International Monetary Fund" or "World Bank" or SAP or "structural adjustment" or "loan conditionalities") and ("health financing" or "health expenditure" or "health spending" or "fiscal space for health")

Farag et al. (2009) (2)	1995-2006	144	WHO NHA (*channel not specified*)	NHA (*GHE-S/A not stated*)	two-way, fixed-effect GLS	LICs: -27 cents (95% CI: 15–40) MICs: -63 cents (95% CI: 32–96)
Lu et al. (2010) (3)	1995-2006	111	OECD CRS and major donor reports (*government and non-government channel*)	IMF, NHA (*GHE-S*)	GMM	-$0.43 to -$1.14. (*government aid channel*)
Stuckler et al. (2011) (4)	1996-2006	119	WHO NHA (*channel not specified*)	NHA (*GHE-S/A not stated*)	Not stated	IMF-borrowing: -$0.998 (SE: 0.22) Non-IMF-borrowing: -$0.55 (SE: 0.11)
Xu et al. (2011) (5)	1995-2008	143	WHO NHA (*channel not specified*)	NHA (*GHE-S*)	FE + dynamic models	*Percent elasticity:* 1% increase in external health financing → LICs: -0.26 to -0.19% Lower-MICs: -0.033% or no sign. change UMICs: no sign. change in GHE-S
Gebrehanna and Upadhyay (2012) (6)	1980-2005	9 (SSA)	OECD *(concessional loans to health sector)*	IMF *(GHE-A)*	Iterative GLS	*Percent elasticity:* 1 percentage point increase in concessional loans to health sector as % of GDP → +1.22 percentage points increase in GHE-A as % of GDP (SE: 0.278)
Van de Sijpe (2013a) (7)	1995-2006	111	OECD CRS *(channelled via government)*	IMF *(GHE-S)*	FE model	"*Little or no displacement*"
Van de Sijpe (2013b) (8)	1990-2003	108	OECD CRS *(general)*	IMF *(GHE-A)*	FE model	*Percent elasticity:* 1 percentage point increase in aid for health/GDP → +0.26 (0.12) percentage points increase in GHE-A, however "*little if any fungibility*" when disaggregating by "on- and off-budget" aid.
Fernandes Antunes et al. (2013) (9)	2002-2007	82	WHO NHA + OECD-DAC (*channel not specified*)	NHA *(GHE-S)*	FE + dynamic models	FE: -$0.41 (SE: 0.069). Insignificant in dynamic model
Dieleman et al. (2013) (10)	1995-2010	134	IHME (*DAH-G and DAH-NG*)	NHA *(GHE-S)*	Two-step system GMM	*-$0.86* (95% CI: 0.63-1.08) *(DAH-G)*
Dieleman et al. (2014) (11)	1995-2010	119	IHME (*DAH-G*)	NHA (*GHE-S*)	Two-step system GMM	-$0.62 (90% CI: 0.15-1.09) (*DAH-G*)
Liang et al. (2014) (12)	1995-2010	120	IHME (*DAH-G and DAH-NG*)	NHA (*GHE-S*)	FE-2SLS	*Percent elasticity:* 1% increase in DAH-G → -0.03 to -0.04% change in GHE-S
Barkat et al. (2016) (13)	1995-2012	45 SSA countries	OECD CRS	NHA *(GHE-S/A not stated*)	GMM, FE-IV	*Percent elasticity:* 1% increase in development assistance for health sector →

						+0.04% to 0.1% change in GHE
Younsi et al. (2016) (14)	1993-2013	113 LMICs	World Bank *(general)*	World Bank *(GHE-S)*	Static and dynamic models, GMM	*Percent elasticity:* 1% increase in development assistance for health sector → -0.19 to -0.25% change in GHE-S among LICs (no sizeable effect among MICs)
Patenaude (2021) (15)	2000-2015	134 LMICs	IHME (*DAH-G and DAH-NG*)	*GHE-S,* source unclear (NHA?)	System GMM	*Percent elasticity:* 1% increase in DAH-G → 0.001-0.002% increase (SE: 0.001-0.002%)

Table 10.2: Summary of multi-country panel data studies of associations between development assistance for the health sector and Government Health Expenditure (GHE). DAH-G: Development Assistance for Health (DAH) channelled via government. DAH-NG: DAH via non-governmental channel. GHE-S: Government Health Expenditure as a Source. GHE-A: Government Health Expenditure as Agent. GLS: Generalized Least Squares, GMM: Generalized Method of Moments, GHE-S: Government Health Expenditure as Source, GHE-A: Government Health Expenditure as Agent, FE-2SLS: Fixed-effects two-stage least squares regression, FE-IV: Fixed Effects Instrumental Variables.

The first panel data study of displacement effects of development assistance for the health sector on GHE, was by Mishra and Newhouse (2009) (1). Based on OECD CRS and IMF data between 1985 and 2004, the authors found a $1 increase in development assistance for the health sector to be associated with a $1.50 increase in GHE. The authors did not include development assistance to reproductive health and sexually transmitted infection control including HIV/AIDS. Farag et al. (2009) included 144 countries from 1995-2006 and found that a $1 increase in development assistance for the health sector was associated with a 27 cent decrease in GHE in LICs 63 cents decrease in MICs on average (2). Lu et al. (2010) found an elasticity of -$0.43 to -$1.14 Government Health Expenditure as Source (GHE-S) for every dollar of development assistance for the health sector received among 111 LMICs over the same time period (3). This study led to serious debate:

Sanjeev Gupta from the IMF argued that this finding should not cause too much concern, as substitution of spending to other sectors e.g. education and sanitation may improve health, higher spending does not necessarily translate into better outcomes, and development assistance for the health sector used to promote macroeconomic stability could lead to higher growth, which in turn would increase a country's revenue base for future spending and could itself improve social indicators (16). Ooms et al. (2010) discussed aid volatility and unpredictability as potential determinants of the observed fungibility, which would thereby function as a financial buffering mechanism, and argued for the establishment of a shared global fund for health to address this (17). David Roodman (2012) raised methodological concerns regarding multiple imputations, erroneous instrumenting and instrument proliferation (18). Batniji and Bendavid (2013) claimed that the conclusions were driven by outliers and highlighted inconsistencies between IMF and WHO GHE-S data, however this paper was

retracted due to statistical errors (19). In a following perspective piece, they argued that the heterogeneity of ODA displacement and the inaccuracy of public health financing data renders these aggregate results inappropriate as a basis for health aid prioritization, and that fungibility is not an inherently adverse phenomenon in that it may merely reflect rational government prioritization across multiple sectors (20) (also discussed by Ooms et al. (2010) (17)). A series of other comments were made that were addressed by Lu et al. (21-29). The debate appeared to settle with Murray, Dieleman, Lu and Hanlon (2013) arguing for the need for improvements in sector-level public expenditure data and statistical methods to be able to investigate the topic of aid fungibility in further detail (30), however this conclusion was followed up with further studies by Dieleman, Hanlon et al, in part in response to a reanalysis of Lu et al.'s data by Van de Sijpe (2013a) (7). Van de Sijpe performed a series of sensitivity tests on the data taking into account "off-budget" aid and found "*little or no displacement of health expenditure from own resources*" (7). Dieleman et al. responded to the raised concerns and analysed an expanded panel of 134 countries between 1995-2010, and found that a $1 increase in Development Assistance for Health (DAH) to Government (DAH-G, as opposed to DAH to non-government recipients: DAH-NG) was still associated with a $0.86 decrease (95% CI: 0.63-1.08) in GHE-S (10). In 2014, analysing a smaller panel of 119 countries between 1995-2010, the authors found that a $1 increase in DAH-G was associated with a $0.62 decrease (90% CI: 0.15-1.09) in GHE-S, whereas a $1 decrease was not significantly associated with GHE-S (11). Providing another aspect to the above debate, Stuckler et al. (2011) found that among IMF-borrowing countries, development assistance for the health sector was completely fungible, whereas in non-borrowing countries, 55 cents on the dollar of was displaced (4).
Further studies of aid fungibility in the health sector were since performed:

In a working paper from the Results for Development Institute, Xu et al. (2011) found a 1% increase in external health financing to correlate with a 0.26%[43] decrease in Domestic General Government Health Expenditure (GGHE-D, which is exactly the same as GHE-S) in LICs up to no significant change in UMICs on average (5).
Based on an analysis of concessional loans disbursed to the health sector in nine SSA countries between 1980-2005, Gebrehanna and Upadhyay (2012) found that these loans were "fully non-fungible": A 1 percentage point increase in loan amounts as a percent of GDP was associated with a 1.22 percentage point increase in government health spending (i.e. GHE-A) as a percent of GDP (6).

[43] lowest average estimate between models reported for LICs (FE model), other estimate was -0.19% (dynamic model).

Van de Sijpe (2013b) analyzed a panel of 108 countries from 1990-2003 and found a 1 percentage point increase in development assistance for the health sector per GDP to be associated with a 0.26 percentage point increase in overall GHE. However, he found little if any evidence of displacement when separating aid into its different channels and argued for the disaggregation of aid by its "on- and off-budget" components when conducting fungibility analyses (8).

Fernandes Antunes et al. (2013) analyzed a panel of 82 countries between 2002-2007 and found, in an FE-model, that a $1 increase in "health-specific aid" was associated with a $0.41 decrease in GHE-S. They also specified a dynamic panel model in which their findings were insignificant (9).

Liang et al. (2014) found a percent elasticity of 0.03 to 0.04% decrease in GHE-S for every 1% increase in DAH on average (panel of 120 countries from 1995 to 2010) (12).

In 2016, Barkat et al. found an increase in development assistance for the health sector of 1% to be associated with an increase in GHE of 0.04 to 0.1%, among 45 SSA countries from 1995-2012 (13).

Younsi et al. (2016) analyzed panel data from 113 LMICs between 1993-2013 and found a 0.19% - 0.25% decrease in GHE-S (depending on model specification) for every 1% increase in development assistance for the health sector among LICs, and no sizeable effect for MICs (14).

Patenaude (2021) found no fungibility effect of DAH, nor DAH-G on GHE-S in 134 LMICs between 2000-2015 (15).

By descriptively comparing trends in DAH and public spending on health as a share of all public spending over time in LICs, Nonvignon et al. (2024) concluded that DAH tends to crowd out public spending on health in LICs[44] (32).

10.1.3. Single-country case studies of fungibility of development assistance for the health sector

In Vietnam, Dodd et al. (2010) found indication of a negative elasticity between donor health project funding and GGHE excluding donor health projects (elasticity ϵ = -0.186 (p= 0.09; n=13; time-period: 1995-2007) (33). The authors noted that this tendential association was less important than the significant positive association observed between the rapid growth in Vietnam and total government health spending (ϵ = 1.875; p<0.001), and that aid was playing a diminishing role in financing the country's health system (3.4% of GGHE in 2007) (33). In another analysis of the Vietnamese health system by Wagstaff (2011), no evidence was found

[44] Same caveat as previously: A descriptive evaluation of (negatively) correlating trends is inadequate for claiming causation (31).

of *intersectoral* fungibility[45] resulting from a primary care HSS project across approx. half of all provinces in Vietnam funded by a WB loan, however there was clear evidence of *intrasectoral* fungibility[46]. The latter was interpreted as consistent with a stated mutual understanding between WB and the Vietnamese government that the government would increase its funding in provinces not supported by WB (34).

Lu et al. (2017) found evidence of additionality between development assistance and government investments at the district level in rural health centres in Rwanda: A $1 increase in ODA per capita allocated to these health centres was associated with a $0.17 increase in government support in the same year (35).

In a 2016 mixed-methods study from Tanzania, Martinez-Alvarez et al. found both quantitative and qualitative evidence of fungibility. DAH was found to be displaced to other sectors as a deliberate policy in the budget allocation process, and also due to macro-economic policies such as debt servicing (36).

In Nigeria, domestic government HIV/AIDS funding in the 2000's and early 2010's was characterized as "*abysmal, as the government has practically handed over financing of HIV services to donors*" (37).

Lupieri and Doetter (2020) have also found descriptive statistical evidence for fungibility of development assistance for the health sector in Jordan[47] (38).

Described as "reverse fungibility", Jackson et al. (2020) found evidence that aid volatility and withdrawal following a corruption scandal led the Zambian government to increase its own budget allocation to primary health care[48] (39).

10.1.4. Econometric studies of IMF effects on government health spending

In a panel of 92 countries from 1980-2000, Noorudin and Simmons (2006) found that IMF programme participation was associated with decreased government share allocation to health and per capita health spending in democracies, and increases in share allocation to health in non-democracies (40).

Using Ordinary Least Squares (OLS) regression on a panel of 63 LICs from 1985-2009, Kentikelenis et al. (2015) found that IMF programs were associated with increased health

[45] Intersector fungibility refers to the movement of domestic funds from a sector that receives external funding to another sector.
[46] Intrasector fungibility refers to the movement of domestic funds from one area within a sector to another area within that sector, when the sector receives external funding.
[47] Same caveats for descriptive statistical evidence apply as in previous sections.
[48] Same as above.

spending in SSA LICs but lowered health spending in non-SSA LICs[49] (41). A follow up study found a negative correlation with health spending across LICs[50] (42).

Stubbs et al. (2017) used OLS on a panel of 16 West-African countries from 1995-2014[51] and found no overall effect of IMF programme participation on government health spending (43), but instead found that "*each additional binding IMF policy reform reduces government health expenditure per capita by 0.248 percent…"* (43).

Daoud and Reinsberg (2019) used Seemingly Unrelated Regression (SUR) on an instrumental variable model of 128 LMICs from 1980-2014, and found that IMF programme participation but not conditionalities were associated with increases in the general government expenditure budget share allocation to public health (44).

The previously mentioned single-country case study of Ghana from 1980-2014 using 3SLS found no effect of IMF conditionalities on government health spending (45).

By simply describing trends over time[52] from 1970-1993, Van der Gaag and Barham (1998) (WB staff) found that for "*countries that started the adjustment process early and took it seriously … Government spending on health care increased on average*" and concluded that "*it appears that the adjustment process can produce the favorable economic environment in which the system-wide health care problems can be addressed adequately*" (46).

Using ARIMA models on data from 146 countries from 1985-2000, the IMF IEO (2003 and 2004) found that government health spending was either maintained or increased under IMF programmes compared to when having no programme (47, 48). An IMF report from 2006 similarly found that LICs had insulated social expenditures from austerity measures (49), and Clements et al. (2011) (IMF staff) also had similar findings using fixed effects and system GMM on data from 1985-2009[53] (50). A 2017 IMF report again found that IMF-supported programs in LICs protected health spending, using a mix of methods reviewing Article IV reports, descriptive statistics and unspecified regression methods (possibly the same as Clements et al. (50-52)[54]). A 2019 IMF report using inverse probability weighted regression adjustment estimation and description of levels and trends reached similar conclusions (53).

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[49] Caveat: While using OLS on observational data across 63 units of observation provides correlational evidence, drawing causal inferences may be more difficult.
[50] Estimation method not stated but deduced to be OLS.
[51] Caveat: Same caveats for OLS as above apply to a larger extent as this panel was much smaller.
[52] Same caveat for drawing causal inference from a description of trends apply as that described in Section 3.5.1.
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10.2. Appendix 2: Key health indicators in Senegal

Senegal is performing better than the SSA average on a number of key health indicators, and these have improved over time. Since 2000, the total life expectancy at birth in Senegal had improved significantly to 69 years in 2019 (WHO African region average: 65 years) (1), the under-5 mortality rate to 39 deaths per 1000 live births in 2021 (WHO African region average: 72 deaths per 1000) (1), and the maternal mortality ratio to 261 deaths per 100,000 live births in 2020 (SSA average: 536 deaths per 100,000 live births) (1, 2). In 2022, 88% of Senegalese one-year-olds had received their third Diphtheria-Tetanus-Polio (DTP) immunisation (WHO African region average: 72%) (3). In 2019, 26% of women of reproductive age, married or in-union, used modern methods of contraception (SSA average: 29%) (1, 2), and the HIV prevalence rate among adults aged 15-49 was 0.3% in 2022 (WHO African region average: 3.2%) (1). Tuberculosis deaths among HIV-negative people had declined to 15 per 100,000

in 2022 (WHO African region average: 26 per 100,000) (1), and deaths due to malaria to 26 per 100,000 population in 2021 (WHO African region average: 58 per 100,000) (1). The age-standardised Non-Communicable Disease (NCD) mortality rate had decreased to 551 deaths per 100,000 population in 2019 (WHO African region average: 587 per 100,000), of which 61% were estimated to be premature deaths (WHO African region average: 64%) (1).

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10.3. Appendix 3: Evidence of retention of copyright (Chapter 5)

ZGHA 2072461 Growing Debt Burden in Low- and Middle-Income Countries During Covid-19 Ma...

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10.4. Appendix 4: Supplementary methods description, results and metadata for Chapter 6

10.4.1. Supplementary methods description

10.4.1.1. Variable names

Variable	Full name
oop_che	Out-Of-Pocket Spending per Current Health Expenditure
oop_gdp	Out-Of-Pocket Spending per Gross Domestic Product
ghes_che	Government Health Expenditure as Source per Current Health Expenditure
ghes_gdp	Government Health Expenditure as Source per Gross Domestic Product
odaplus_health_pub_gdp	Official Development Assistance+ for health channeled via recipient country public sector per Gross Domestic Product
odaplus_health_civpriv_gdp	Official Development Assistance+ for health channeled via NGO's, CSO's and private sector per Gross Domestic Product
odaplus_nonhealth_pub_gdp	Official Development Assistance+ for non-health purposes channeled via recipient country public sector per Gross Domestic Product
odaplus_nonhealth_civpriv_gdp	Official Development Assistance+ for non-health purposes channeled via NGO's, CSO's and private sector per Gross Domestic Product
debt_serv_gdp	Debt Service per Gross Domestic Product (external Public and Publicly Guaranteed)
debt_stock_gdp	Debt Stock per Gross Domestic Product (external Public and Publicly Guaranteed)
imf_cond_ba1tot	International Monetary Fund Conditionalities Burden of Adjustment Indicator 1, Total (all policy areas)
imf_part	International Monetary Fund programme Participation
gdp_cap_c	Gross Domestic Product per Capita (constant 2020 US$)
imr	Infant Mortality Rate
gov_eff	Government Effectiveness
corr_control	Corruption Control
battle_dum	Battle Dummy
col_indfrom_uk	Colonial Independence from United Kingdom
col_indfrom_fra	Colonial Independence from France
col_indfrom_spa	Colonial Independence from Spain

Please see Metadata (Section 10.4.5) for further details on variables in dataset.

10.4.1.2. Country list

Albania
Algeria
Angola
Argentina
Armenia
Azerbaijan
Bangladesh
Belarus
Belize
Benin
Bolivia
Bosnia and Herzegovina
Botswana
Brazil
Burkina Faso
Burundi
Cambodia
Cameroon
Cape Verde
Central African Republic
Chad
China
Colombia
Comoros
Congo
Costa Rica
Cote d'Ivoire
Democratic Republic of Congo
Djibouti
Dominican Republic
Ecuador
Egypt
El Salvador
Eswatini
Ethiopia
Fiji
Gabon
Gambia
Georgia
Ghana
Guatemala
Guinea
Guinea-Bissau
Guyana
Haiti
Honduras
India
Indonesia
Iran
Jamaica
Jordan
Kazakhstan
Kenya
Kyrgyz Republic
Laos
Lebanon
Lesotho
Liberia
Madagascar
Malawi
Mali
Mauritania
Mauritius
Mexico
Moldova
Mongolia
Morocco
Mozambique
Myanmar
Nepal
Nicaragua
Niger
Nigeria
North Macedonia
Pakistan
Papua New Guinea
Paraguay
Peru
Philippines
Rwanda
Samoa
Sao Tome and Principe
Senegal
Serbia
Sierra Leone
Solomon Islands
South Africa
Sri Lanka
Sudan
Tajikistan
Tanzania
Thailand
Togo
Tonga
Tunisia
Turkey
Turkmenistan
Uganda
Ukraine
Uzbekistan
Vanuatu
Vietnam
Yemen
Zambia
Zimbabwe

10.4.1.3. Variable description, motivation and hypotheses

Table 6.1 (main manuscript) shows summary descriptive statistics for the variables used in our models.

10.4.1.3.1. Dependent variables

Our dependent variables are described and motivated in the main manuscript.

10.4.1.3.2. Independent variables of interest

We used the following set of main input variables of interest. We examined Official Development Assistance Plus (ODA$^+$) for health from the OECD CRS database, which includes disbursements from Development Assistance Committee (DAC) countries, non-DAC countries, multilaterals and the BMGF[55] due to their substantial development assistance contributions (1, 2). The categories "Health, Total" and "Population Policies/Programmes and Reproductive Health, Total" were included in this variable, while other categories were counted as non-health ODA. Following the majority of the available literature, we mainly hypothesized a displacement/ crowding out effect of ODA$^+$ for health on GHE-S (i.e. fungibility) as well as on OOP. Also following the literature on government health spending (3-8), we hypothesized that a fungibility dynamic would depend on whether the development assistance is "on-budget" or "off-budget", which determines whether or not the government can see and predict development assistance coming in and adjust its own budget accordingly. We therefore disaggregated our ODA$^+$-variables into development assistance channelled via the recipient country public sector, and channelled via Non-Governmental Organisations (NGO's), Civil Society Organisations (CSO's) or Private Sector Institutions (PSI's), jointly referred to as the civil/private sector. For OOP as a dependent variable, we hypothesized that ODA$^+$ for health via either channel would have a displacing effect, as either could work to subsidise or cover user fees. Other studies have found respectively no association (disaggregated by channel) (8) and a negative association (not disaggregated by channel) (9). As Government Health Expenditure as Agent in LMICs (GHE-A, i.e. all government health spending from domestic and external revenue) ≈ GHE-S + on-budget development assistance to the health sector (10), fungibility implies a negative relationship between on-budget ODA$^+$ for health and GHE-S, reflecting that a $1 external injection of funds into the health sector did not raise GHE-A by $1 due to the government lowering its own financing (GHE-S) (7).

[55] We counted all BMGF development finance on the OECD CRS database as grants, even though this is not specified in the database. This was based on the conservative assumption that the vast majority if not all of these transfers are indeed grants, since the BMGF had given 34523 total grants with a substantial proportion to health, and only 10 loans within health as of November 10, 2023 (https://www.gatesfoundation.org/about/committed-grants; https://sif.gatesfoundation.org/portfolio/).

We also explored non-health ODA$^+$ (2), to explore whether development assistance outside the health sector influences levels of government and household health financing (11, 12). The main hypothesis tested was that of non-health sectoral aid benefiting the health sector by allowing governments to shift some extra funds toward the health sector, i.e. that on-budget non-health ODA$^+$ would correlate positively with GHE-S per GDP and/or per CHE. However, if GDP growth effects are equal to or stronger than any positive effects on GHE-S, no correlation/negative correlation would be seen for GHE-S/GDP (we also run a GHE-S/capita analysis as sensitivity analysis in this appendix). Importantly, the variables also control for the macroeconomic effects of non-health aid flows. We deducted debt relief, administrative expenses, other in-donor country expenses and promotion of development awareness from ODA$^+$ variables to count only real financial transfers with a development purpose. Using two-sided T-tests, we allowed for the alternative hypotheses that ODA+ for health could crowd in GHE-S and ODA+ for non-health sectors could draw domestic government funds away from the health sector, e.g. through co-financing requirements.

We examined the effects of PPG external debt service from the WB International Debt Statistics database (13). In theory, increased debt servicing should take away money from the public budget, reducing the fiscal space for all government expenses including the health sector, leading to our main hypotheses of a negative association between PPG external debt servicing and GHE-S/GDP and/or GHE-S/CHE. Alternatively, the ability to service one's debt could reflect favourable fiscal conditions and/or occur at a manageable level posing no risk of "debt distress", with enough revenue to finance both debt and health, which would show as the confirmation of our null-hypothesis of no effect. We further take into consideration the PPG external debt stock per GDP (13), similar to Lora and Olivera (2007) (14). This allows us to adjust for the level of indebtedness, i.e. adjusted for the size of the debt relative to the size of the economy, are increases in debt servicing per GDP associated with decreases in GHE-S/GDP or GHE-S/CHE, and associated increases in OOP/GDP or OOP/CHE? It also allows us to examine any effects of the debt stock itself on our outcome variables (14).

We included a variable capturing the level of adjustment due to IMF conditions using the IMF Monitor conditionality dataset (15). The variable counts the number of conditions in place in a given country-year. More conditions could lead to less GHE-S generally through what can be referred to as an austerity effect (16-27), which is our main hypothesis. IMF/WB authors have conversely found that they could lead to more GHE-S (28-32), meaning that conditions lead to growth and more fiscal space for health, and that health spending is protected from any austerity measures. As for OOP, we hypothesize that privatization and decentralisation measures resulting from IMF conditionalities, as well as an indirect effect via the above

austerity effect where the state funds less health services and users have to take over payment, could lead to increases in OOP. To isolate the marginal effect of an additional conditionality within an IMF programme, we included a dummy-variable for IMF programme participation, generated from the conditionality variable ("on" when conditions observed) (33). This also captures any effects of IMF programme participation separate from those acting through conditionalities, such as catalysing development assistance and investment, or effects of technical assistance or other means of policy influence (33-35).

10.4.1.3.3. Covariates

We adjusted our models using a set of covariates. We included GDP per capita (constant 2020 US$) (36), as this may codetermine both our outcome variables, independent variables of interest and covariates. We included Infant Mortality Rate (IMR) as a proxy for unmet population health need (11, 37, 38), from the United Nations Inter-Agency Group for Child Mortality Estimation (39). Such unmet need may reflect a low GHE-S and a high resulting reliance on OOP, as well as health need driving OOP health expenditures. IMR has also been identified as the strongest health need determinant of development assistance for health allocations, above Under-5 Mortality Rate (U5MR) and Human Immunodeficiency Virus (HIV) prevalence (37).

We included a variable capturing government effectiveness and a variable measuring control of corruption from the Worldwide Governance Indicators database (40). These are commonly used in the development assistance literature as they are found to codetermine aid flows and aid effectiveness, including development lending (e.g. (41-47)). A country's governance also results from and determines IMF programme participation, policy recommendations and conditionalities (48). More corrupt governments have been found to spend less on health (49, 50), and the same is true for less effective governments (10, 40). These variables might also help explain why development assistance and government health expenditure fail to translate into reduced dependency on OOP health spending.

We adjusted for the effects of a country being in armed conflict, by including a dummy variable for when the number of deaths in battle[56] was larger than or equal to 1 per million population in a country-year, using the Uppsala Conflict Data Program / Peace Research Institute Oslo Battle-Related Deaths Dataset (51). Development assistance and lending flows have by some been found to differ (52, 53), and by others not to differ (54), between countries depending on conflict status. Receiving development assistance has been found to be associated with a

[56] We replaced missing values for battle-related deaths with 0's, as this dataset only report recorded battle-related deaths and assign missing values to all other country-years.

higher likelihood of conflict escalation (55), and GHE has been found to suffer in war-ridden countries (56). We further hypothesize that conflict might cause an increased reliance on OOP health spending in a destabilised health economy.

Finally, we examined for differences in the effects of colonial legacy between former British, French and Spanish colonies. Bilateral donors tend to give more development assistance to their former colonies (examples: (57-60)), and the economies and institutions of formerly colonized nations are partly shaped by their colonial legacy (61-63), including their health system models (64). We hypothesize that this could also co-determine health system payment patterns, both by system inheritance and by ongoing policy influence from the former coloniser. We used the Issue Correlates Of War dataset for this, using a variable categorizing from which colonial ruler independence was gained from (65).

10.4.1.4. Approach to issue of serial correlation in dependent variables

The issue of serial correlation in dependent variables is commonly seen in the literature (e.g. (24, 96, 97), including for GHE-S/GDP as dependent variable (24)). By including lagged dependent variables, the amount of explanatory power contained in last year's variable level is accounted for, and our independent variable estimates and error terms contain the remaining explanatory power beyond this. The use of instrumentation in System GMM is the preferred approach when faced with serial correlation in panel data series (85). The Arellano-Bond test for first-order serial correlation of the error terms in the levels equation is the guiding test in this situation (85, 86). We made sure that all p-values were above 0.15, including by adding 2nd-order lags where necessary, thus safely accepting the null-hypothesis that lagged GMM-style instruments were not made invalid by serial correlation of residuals (85). By not breaking up our dataset into subsets, we ensured our dataset was large enough to ensure validity of this test. Our unit root tests further firmly confirmed the absence of a unit root (below). These estimation choices and testing should thus have adequately addressed potential inference issues present when examining dependent variables that are serially correlated.

10.4.2. Supplementary findings

10.4.2.1. Results from full model regressions

Two-step system GMM results for full model specifications

Dependent variable	1) OOP/CHE	2) Ln(OOP / GDP)	3) GHE-S / CHE	4) Ln(GHE-S / GDP)
L. dependent variable	0.708*** [0.053]	0.903*** [0.052]	0.823*** [0.077]	0.819*** [0.061]
L. ln(ODA+ for health (public) / GDP)	-0.389 [0.301]	-0.018* [0.010]	-0.311 [0.282]	-0.022** [0.011]
L. ln(ODA+ for health (civ./priv.) / GDP)	-0.456** [0.195]	-0.014* [0.007]	-0.159 [0.260]	0.003 [0.009]
L. ln(ODA+ for non-health (public) / GDP)	0.086 [0.337]	-0.008 [0.014]	-0.018 [0.377]	0.004 [0.016]
L. ln(ODA+ for non-health (civ./priv.) /GDP)	0.149 [0.533]	-0.026 [0.019]	0.311 [0.425]	0.019 [0.018]
L. ln(debt service/GDP)	0.563* [0.292]	0.019 [0.017]	-0.401 [0.294]	0.004 [0.011]
L. ln(debt stock/GDP)	0.176 [0.688]	-0.026 [0.021]	-0.159 [0.821]	-0.018 [0.026]
IMF conditionalities	-0.015 [0.012]	-0.000 [0.000]	0.016 [0.014]	-0.000 [0.000]
IMF participation	0.375 [0.462]	0.012 [0.022]	-1.131* [0.640]	0.006 [0.022]
Ln(GHE-S/GDP)	-7.530*** [1.664]	0.063* [0.037]	-	-
Ln(GDP/cap)	-0.077 [1.697]	-0.155** [0.070]	2.206 [2.336]	-0.055 [0.071]
IMR	-0.106** [0.050]	-0.002 [0.002]	-0.015 [0.060]	-0.000 [0.002]
Gov. effectiveness	-0.488 [1.480]	-0.049 [0.053]	-0.961 [1.715]	0.012 [0.053]
Corruption control	-1.607 [1.391]	-0.016 [0.060]	2.603[2.210]	0.052 [0.059]
Conflict	0.559 [0.745]	0.019 [0.023]	0.147 [0.606]	0.031 [0.027]
Ind. from UK	-1.933 [1.216]	-0.015 [0.043]	-0.447 [1.286]	0.007 [0.054]
Ind. from France	-0.220 [1.629]	0.031 [0.054]	-0.154 [1.069]	-0.054 [0.037]
Ind. from Spain	-0.532 [1.480]	0.005 [0.059]	0.524 [1.678]	0.037 [0.028]
Constant	16.382 [14.770]	1.193** [0.578]	-8.906 [18.296]	0.016 [0.047]
Observations	1429	1429	1429	1429
Countries	105	105	105	105
Instruments	92	92	73	73
Lag limits (years)	4	4	3	3
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
AB-test AR(2) (p-level)	0.996	0.756	0.155	0.513
Hansen test (p-level)	0.262	0.366	0.198	0.544
Diff.-in-Hansen test (p-level)	0.229	0.305	0.847	0.190
F-statistic	520.66***	165.84***	886.84***	260.43***

Windmeijer-corrected robust standard errors in brackets; *p < 0.1, **p<0.05, ***p<0.01
Civ./priv: ODA+ channelled via NGO's & civil society organisations or private sector institutions.
AB-test AR(2) = Arellano-Bond test for first-order autocorrelation in the levels equation. Diff.-in-Hansen test: Difference-in-Hansen test for exogeneity of GMM instruments in levels equation. Govt.= Government. IMR= Infant Mortality Rate. Ind. = Independence (colonial). L. = 1-year lag. Ln= natural logarithm.

10.4.2.2. Other findings for ODA variables

ODA+ for health purposes disbursed to the civil/private sector measured per GDP, correlated negatively with OOP/CHE in our full model (semi-elasticity: -0.456) though not in our reduced model. This association was not present at other lag-levels, it only tolerated increasing the GMM-style lag limit by 1, and it was robust to most but not all covariate swaps (below). There was a near-significant negative correlation with OOP/GDP in the full model (p=0.050), which was just significant in our reduced model (p=0.047). This effect was also present at the 2nd order lag but not when unlagged, at GMM-style lag limits 5, 7 and 8, and with all covariate swaps. We found no association with GHE-S/CHE or with GHE-S/GDP.

We also found a significant negative association between ODA+ for non-health purposes channelled via the civil/private sector and OOP/GDP in our reduced model (elasticity: -0.04), but not our full model. This finding was not robust to changes in the lag limit. The effect was also present in a 2nd order lag version of our full model but not of the reduced model, and not in a contemporaneous version. It was robust to all covariate swaps.

10.4.2.3. Covariate findings

We made the following findings among our included covariates:

A 1% increase in GHES/GDP was associated with a -0.08 percentage point decrease in OOP/CHE, both in full ([-0.11: -0.04], p=0.000) and reduced ([-0.11: -0.05], p=0.000) models. This association remained significant when chancing variable lag-structures, GMM-style instrument lag limits (below) and covariates. A 1% increase in GHES/GDP was also associated with a 0.07% ([0.001: 0.14], p=0.048) increase in OOP/GDP in the reduced model, which was also robust to the same changes.

We found a significant negative association between GDP per capita and OOP/GDP (full model: elasticity: -0.15 ([-0.29: -0.02], p=0.02); reduced model: elasticity -0.25 ([-0.40: -0.11], p=0.001). This finding only remained in reduced model versions with 2nd order lags of the independent variables of interest, but not other variable lag variations. It was however robust to changes in GMM-style lag limits and to many but not all covariate swaps.

One additional infant dying before reaching one year of age per 1,000 live births was associated with a -0.1 ([-0.20: -0.008], p=0.038) percentage point decrease in OOP/CHE in our full model, but this was insignificant in our reduced model (p=0.058). The finding was not robust to changes in lag-levels of independent variables of interest, but it was robust to changing GMM lag limits and to some, but not all covariate swaps.

A one standard-deviation increase in the level of control of corruption as measured in the Worldwide Governance Indicators (40) was associated with a 3.2 ([0.61: 5.75], p=0.017) percentage point increase in GHES/CHE in our reduced model. This finding was robust when independent variables of interest were lagged two years, but not when they were contemporaneous. The finding remained when increasing, but not decreasing lag limits, and it was robust to swapping mortality indicators but not colonial history covariates.

10.4.3. Diagnostic test results

10.4.3.1. Correlation matrices

Pairwise correlations, significance level p<0.05

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1) oop_che	1.00																			
(2) oop_gdp	-0.65*	1.00																		
(3) ghes_che	0.78*	-0.46*	1.00																	
(4) ghes_gdp	-0.56*	0.82*	-0.13*	1.00																
(5) ln_odaplus_health_pub_gdp	-0.10*	-0.39*	-0.17*	-0.32*	1.00															
(6) ln_odaplus_health_civpriv_gdp	-0.06*	-0.47*	-0.08*	-0.35*	0.82*	1.00														
(7) ln_odaplus_nonhealth_pub_gdp	-0.07*	-0.29*	-0.08*	-0.21*	0.81*	0.70*	1.00													
(8) ln_odaplus_nonhealth_civpriv_gdp	-0.03	-0.38*	0.01	-0.25*	0.77*	0.79*	0.82*	1.00												
(9) ln_debt_serv_gdp	-0.08*	0.29*	0.02	0.29*	-0.18*	-0.20*	-0.05	-0.11*	1.00											
(10) ln_debt_stock_gdp	0.00	-0.11*	0.06*	-0.05*	0.36*	0.32*	0.47*	0.48*	0.54*	1.00										
(11) imf_cond_ba1tot	0.09*	-0.22*	0.15*	-0.12*	0.25*	0.23*	0.30*	0.29*	0.01	0.17*	1.00									
(12) imf_part	0.10*	-0.26*	0.17*	-0.13*	0.29*	0.28*	0.37*	0.34*	0.01	0.20*	0.84*	1.00								
(13) gdp_cap_c	-0.22*	0.68*	-0.13*	0.58*	-0.69*	-0.70*	-0.59*	-0.68*	0.31*	-0.27*	-0.27*	-0.31*	1.00							
(14) imr	0.24*	-0.64*	0.04	-0.66*	0.49*	0.52*	0.31*	0.40*	-0.33*	0.08*	0.22*	0.23*	-0.72*	1.00						
(15) gov_eff	-0.33*	0.56*	-0.19*	0.56*	-0.36*	-0.46*	-0.26*	-0.45*	0.29*	-0.10*	-0.16*	-0.19*	0.60*	-0.61*	1.00					
(16) corr_control	-0.49*	0.51*	-0.33*	0.53*	-0.08*	-0.18*	0.03	-0.16*	0.19*	-0.01	-0.09*	-0.07*	0.40*	-0.41*	0.74*	1.00				
(17) battle_dum	0.19*	-0.13*	0.08*	-0.18*	-0.11*	-0.05*	-0.07*	0.03	-0.06*	-0.09*	0.02	0.03	-0.13*	0.17*	-0.13*	-0.19*	1.00			
(18) col_indfrom_uk	-0.21*	0.00	-0.27*	0.00	0.23*	0.18*	0.05*	0.06*	-0.06*	-0.02	-0.07*	-0.08*	-0.05	0.12*	0.12*	0.18*	-0.01	1.00		
(19) col_indfrom_fra	0.16*	-0.27*	0.01	-0.36*	0.17*	0.15*	0.23*	0.18*	-0.11*	0.08*	0.14*	0.16*	-0.24*	0.38*	-0.34*	-0.23*	0.04	-0.31*	1.00	
(20) col_indfrom_spa	-0.08*	0.21*	0.05	0.23*	-0.32*	-0.22*	-0.27*	-0.20*	0.11*	-0.06*	-0.10*	-0.11*	0.26*	-0.19*	0.12*	0.03	0.00	-0.14*	-0.13*	1.00

Pairwise correlations, significance level p<0.001

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1) oop_che	1.00																			
(2) oop_gdp	-0.65*	1.00																		
(3) ghes_che	0.78*	-0.46*	1.00																	
(4) ghes_gdp	-0.56*	0.82*	-0.13*	1.00																
(5) ln_odaplus_health_pub_gdp	-0.10*	-0.39*	-0.17*	-0.32*	1.00															
(6) ln_odaplus_health_civpriv_gdp	-0.06	-0.47*	-0.08	-0.35*	0.82*	1.00														
(7) ln_odaplus_nonhealth_pub_gdp	-0.07	-0.29*	-0.08	-0.21*	0.81*	0.70*	1.00													
(8) ln_odaplus_nonhealth_civpriv_gdp	-0.03	-0.38*	0.01	-0.25*	0.77*	0.79*	0.82*	1.00												
(9) ln_debt_serv_gdp	-0.08	0.29*	0.02	0.29*	-0.18*	-0.20*	-0.05	-0.11*	1.00											
(10) ln_debt_stock_gdp	0.00	-0.11*	0.06	-0.05	0.36*	0.32*	0.47*	0.48*	0.54*	1.00										
(11) imf_cond_ba1tot	0.09*	-0.22*	0.15*	-0.12*	0.25*	0.23*	0.30*	0.29*	0.01	0.17*	1.00									
(12) imf_part	0.10*	-0.26*	0.17*	-0.13*	0.29*	0.28*	0.37*	0.34*	0.01	0.20*	0.84*	1.00								
(13) gdp_cap_c	-0.22*	0.68*	-0.13*	0.58*	-0.69*	-0.70*	-0.59*	-0.68*	0.31*	-0.27*	-0.27*	-0.31*	1.00							
(14) imr	0.24*	-0.64*	0.04	-0.66*	0.49*	0.52*	0.31*	0.40*	-0.33*	0.08	0.22*	0.23*	-0.72*	1.00						
(15) gov_eff	-0.33*	0.56*	-0.19*	0.56*	-0.36*	-0.46*	-0.26*	-0.45*	0.29*	-0.10*	-0.16*	-0.19*	0.60*	-0.61*	1.00					
(16) corr_control	-0.49*	0.51*	-0.33*	0.53*	-0.08	-0.18*	0.03	-0.16*	0.19*	-0.01	-0.09*	-0.07	0.40*	-0.41*	0.74*	1.00				
(17) battle_dum	0.19*	-0.13*	0.08	-0.18*	-0.11*	-0.05	-0.07	0.03	-0.06	-0.09*	0.02	0.03	-0.13*	0.17*	-0.13*	-0.19*	1.00			
(18) col_indfrom_uk	-0.21*	0.00	-0.27*	0.00	0.23*	0.18*	0.05	0.06	-0.06	-0.02	-0.07	-0.08	-0.05	0.12*	0.12*	0.18*	-0.01	1.00		
(19) col_indfrom_fra	0.16*	-0.27*	0.01	-0.36*	0.17*	0.15*	0.23*	0.18*	-0.11*	0.08	0.14*	0.16*	-0.24*	0.38*	-0.34*	-0.23*	0.04	-0.31*	1.00	
(20) col_indfrom_spa	-0.08	0.21*	0.05	0.23*	-0.32*	-0.22*	-0.27*	-0.20*	0.11*	-0.06	-0.10*	-0.11*	0.26*	-0.19*	0.12*	0.03	0.00	-0.14*	-0.13*	1.00

10.4.3.2. Variance Inflation Factors for multicollinearity

The below tables show variables with moderate/high degrees of multicollinearity, having Variance Inflation Factors (VIF) above 5, for all models:

Model 1)

Variable	VIF
L. ln_odaplus_nonhealth_pub_gdp	6.42
L. ln_odaplus_health_pub_gdp	6.01
L. ln_odaplus_nonhealth_civpriv_gdp	5.86
ln_gdp_cap_c	5.04

Model 2)

Variable	VIF
L. ln_odaplus_nonhealth_pub_gdp	6.40
L. ln_odaplus_health_pub_gdp	6.11
L. ln_odaplus_nonhealth_civpriv_gdp	5.88
ln_gdp_cap_c	5.17

Model 3)

Variable	VIF
L. ln_odaplus_nonhealth_pub_gdp	6.40
L. ln_odaplus_health_pub_gdp	5.88
L. ln_odaplus_nonhealth_civpriv_gdp	5.72
ln_gdp_cap_c	5.42

Model 4)

Variable	VIF
L. ln_odaplus_nonhealth_pub_gdp	6.40
L. ln_odaplus_nonhealth_civpriv_gdp	5.86
L. ln_odaplus_health_pub_gdp	5.85
ln_gdp_cap_c	5.03

Model 1a)

None

Model 2a)

None

Model 3a)

Variable	VIF
L. ghes_che	17.84
L2. ghes_che	17.37

Model 4a)

None

10.4.3.3. Unit root testing of dependent variables

AIC= Akaike Information Criterion. Null hypothesis: Panels contain unit root. For Im-Pesaran Shin unit-root test: T-bar needs to have a higher absolute value than cut-off to reject null.

OOP/CHE

Test type	ADF lags	Trend?	Demean?	Test statistic	Value	5% alpha-level cutoff
Fisher-type unit-root test (Augmented Dickey-Fuller)	1	Yes	No	Inverse chi-squared (p-value)	0.0000	
Fisher-type unit-root test (Augmented Dickey-Fuller)	1	Yes	Yes	Inverse chi-squared (p-value)	0.0000	
Fisher-type unit-root test (Phillips-Perron)	1	Yes	No	Inverse chi-squared (p-value)	0.0000	
Fisher-type unit-root test (Phillips-Perron)	1	Yes	Yes	Inverse chi-squared (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	0	Yes	No	T-bar	-2.3920	-2.320
Im-Pesaran-Shin unit-root test	0	Yes	No	Z-t-tilde-bar (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	0	Yes	Yes	T-bar	-2.3511	-2.320
Im-Pesaran-Shin unit-root test	0	Yes	Yes	Z-t-tilde-bar (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	2.00 (chosen by AIC)	Yes	No	W-t-bar (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	2.07 (chosen by AIC)	Yes	Yes	W-t-bar (p-value)	0.0000	
Levin-Lin-Chu	1	Yes	No	Adjusted t (p-value)	0.0000	
Levin-Lin-Chu	1	Yes	Yes	Adjusted t (p-value)	0.0000	
Levin-Lin-Chu	2.00 (chosen by AIC)	Yes	No	Adjusted t (p-value)	0.0000	
Levin-Lin-Chu	2.07 (chosen by AIC)	Yes	Yes	Adjusted t (p-value)	0.0000	

Ln(OOP/GDP)

Test type	Lags	Trend?	Demean?	Test statistic	Value	5% alpha-level cutoff
Fisher-type unit-root test (Augmented Dickey-Fuller)	1	Yes	No	Inverse chi-squared (p-value)	0.0000	
Fisher-type unit-root test (Augmented Dickey-Fuller)	1	Yes	Yes	Inverse chi-squared (p-value)	0.0000	
Fisher-type unit-root test (Phillips-Perron)	1	Yes	No	Inverse chi-squared (p-value)	0.0000	
Fisher-type unit-root test (Phillips-Perron)	1	Yes	Yes	Inverse chi-squared (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	0	Yes	No	T-bar	-2.3856	-2.320
Im-Pesaran-Shin unit-root test	0	Yes	No	Z-t-tilde-bar (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	0	Yes	Yes	T-bar	-2.3941	-2.320
Im-Pesaran-Shin unit-root test	0	Yes	Yes	Z-t-tilde-bar (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	2.13 (chosen by AIC)	Yes	No	W-t-bar (p-value)	0.0004	
Im-Pesaran-Shin unit-root test	2.21 (chosen by AIC)	Yes	Yes	W-t-bar (p-value)	0.0000	
Levin-Lin-Chu	1	Yes	No	Adjusted t (p-value)	0.0000	
Levin-Lin-Chu	1	Yes	Yes	Adjusted t (p-value)	0.0000	
Levin-Lin-Chu	2.13 (chosen by AIC)	Yes	No	Adjusted t (p-value)	0.0223	
Levin-Lin-Chu	1.21 (chosen by AIC)	Yes	Yes	Adjusted t (p-value)	0.0000	

GHES/CHE

Test type	Lags	Trend?	Demean?	Test statistic	Value	5% alpha-level cutoff
Fisher-type unit-root test (Augmented Dickey-Fuller)	1	Yes	No	Inverse chi-squared (p-value)	0.0000	
Fisher-type unit-root test (Augmented Dickey-Fuller)	1	Yes	Yes	Inverse chi-squared (p-value)	0.0000	
Fisher-type unit-root test (Phillips-Perron)	1	Yes	No	Inverse chi-squared (p-value)	0.0000	
Fisher-type unit-root test (Phillips-Perron)	1	Yes	Yes	Inverse chi-squared (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	0	Yes	No	T-bar	-2.5662	-2.320
Im-Pesaran-Shin unit-root test	0	Yes	No	Z-t-tilde-bar (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	0	Yes	Yes	T-bar	-2.5712	-2.320
Im-Pesaran-Shin unit-root test	0	Yes	Yes	Z-t-tilde-bar (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	1.78 (chosen by AIC)	Yes	No	W-t-bar (p-value)	0.0247	
Im-Pesaran-Shin unit-root test	1.85 (chosen by AIC)	Yes	Yes	W-t-bar (p-value)	0.0019	
Levin-Lin-Chu	1	Yes	No	Adjusted t (p-value)	0.0000	
Levin-Lin-Chu	1	Yes	Yes	Adjusted t (p-value)	0.0000	
Levin-Lin-Chu	1.78 (chosen by AIC)	Yes	No	Adjusted t (p-value)	0.0000	
Levin-Lin-Chu	1.85 (chosen by AIC)	Yes	Yes	Adjusted t (p-value)	0.0000	

Ln(GHES/GDP)

Test type	Lags	Trend?	Demean?	Test statistic	Value	5% alpha-level cutoff
Fisher-type unit-root test (Augmented Dickey-Fuller)	1	Yes	No	Inverse chi-squared (p-value)	0.0000	
Fisher-type unit-root test (Augmented Dickey-Fuller)	1	Yes	Yes	Inverse chi-squared (p-value)	0.0000	
Fisher-type unit-root test (Phillips-Perron)	1	Yes	No	Inverse chi-squared (p-value)	0.0000	
Fisher-type unit-root test (Phillips-Perron)	1	Yes	Yes	Inverse chi-squared (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	0	Yes	No	T-bar	-2.4913	-2.320
Im-Pesaran-Shin unit-root test	0	Yes	No	Z-t-tilde-bar (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	0	Yes	Yes	T-bar	-2.5598	-2.320
Im-Pesaran-Shin unit-root test	0	Yes	Yes	Z-t-tilde-bar (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	1.98 (chosen by AIC)	Yes	No	W-t-bar (p-value)	0.0000	
Im-Pesaran-Shin unit-root test	2.25 (chosen by AIC)	Yes	Yes	W-t-bar (p-value)	0.0000	
Levin-Lin-Chu	1	Yes	No	Adjusted t (p-value)	0.0000	
Levin-Lin-Chu	1	Yes	Yes	Adjusted t (p-value)	0.0000	
Levin-Lin-Chu	1.98 (chosen by AIC)	Yes	No	Adjusted t (p-value)	0.0000	
Levin-Lin-Chu	2.25 (chosen by AIC)	Yes	Yes	Adjusted t (p-value)	0.0000	

10.4.4. Sensitivity analysis

10.4.4.1. Alternative lag-specifications

(Year dummies were included in all models but not presented here for brevity. GMM-style instrument generation limited to 5-year lags to show isolated effect of changing lag structures).

No lags on independent variables of interest:

- Full models:

Model 1

oop_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. oop_che	.72	.06	13.12	0	.61	.83	***
ln_odaplus_health_pub_gdp	-.27	.29	-0.93	.35	-.83	.3	
ln_odaplus_health_civpriv_gdp	-.37	.21	-1.80	.08	-.78	.04	*
ln_odaplus_nonhealth_pub_gdp	.53	.55	0.97	.33	-.55	1.62	
ln_odaplus_nonhealth_civpriv_gdp	.11	.37	0.28	.78	-.64	.85	
ln_debt_serv_gdp	-.18	.54	-0.34	.74	-1.26	.9	
ln_debt_stock_gdp	.19	.78	0.25	.8	-1.36	1.74	
imf_cond_ba1tot	-.01	.01	-0.57	.57	-.03	.02	
imf_part	.43	.54	0.80	.43	-.64	1.49	
ln_ghes_gdp	-6.94	1.49	-4.67	0	-9.89	-3.99	***
ln_gdp_cap_c	-.19	2.09	-0.09	.93	-4.34	3.95	
imr	-.11	.06	-1.91	.06	-.23	0	*
gov_eff	-.39	1.76	-0.22	.83	-3.88	3.1	
corr_control	-1.19	2.27	-0.53	.6	-5.7	3.31	
battle_dum	.84	.83	1.00	.32	-.82	2.49	
col_indfrom_uk	-1.99	1.68	-1.18	.24	-5.33	1.35	
col_indfrom_fra	-.87	1.72	-0.51	.61	-4.29	2.55	
col_indfrom_spa	.34	1.36	0.25	.8	-2.37	3.05	
Mean dependent var		40.102	SD dependent var		19.365		
Number of obs		1443	F-test		766.482		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 92
Lag limit (years): 4
AB test (AR2) (p-value): 0.916
Hansen test (p-value): 0.220
Difference-in-Hansen test (p-value): 0.525

Model 2

ln_oop_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ln_oop_gdp	.94	.05	17.69	0	.83	1.04	***
ln_odaplus_health_pub_gdp	-.01	.01	-1.29	.2	-.03	.01	
ln_odaplus_health_civpriv_gdp	-.01	.01	-1.21	.23	-.03	.01	
ln_odaplus_nonhealth_pub_gdp	.01	.02	0.33	.74	-.03	.05	
ln_odaplus_nonhealth_civpriv_gdp	.01	.01	0.59	.56	-.02	.04	
ln_debt_serv_gdp	-.01	.01	-0.86	.39	-.03	.01	
ln_debt_stock_gdp	.03	.03	0.92	.36	-.03	.08	
imf_cond_ba1tot	0	0	-0.75	.46	0	0	
imf_part	.01	.02	0.43	.67	-.03	.05	
ln_ghes_gdp	.07	.04	1.71	.09	-.01	.14	*
ln_gdp_cap_c	-.07	.07	-1.00	.32	-.19	.06	
imr	0	0	0.13	.9	0	0	
gov_eff	0	.05	0.10	.92	-.09	.1	

corr_control	-.02	.05	-0.45	.65	-.12	.08	
battle_dum	.03	.02	1.66	.1	-.01	.07	*
col_indfrom_uk	-.03	.04	-0.72	.47	-.11	.05	
col_indfrom_fra	-.01	.05	-0.14	.89	-.1	.08	
col_indfrom_spa	0	.06	0.05	.96	-.12	.13	
Mean dependent var		0.550	SD dependent var		0.733		
Number of obs		1443	F-test		261.474		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 92
Lag limit (years): 4
AB test (AR2) (p-value): 0.458
Hansen test (p-value): 0.275
Difference-in-Hansen test (p-value): 0.170

Model 3

ghes_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ghes_che	.83	.08	9.84	0	.66	.99	***
ln_odaplus_health_pub_gdp	.03	.25	0.11	.92	-.48	.53	
ln_odaplus_health_civpriv_gdp	-.16	.19	-0.82	.41	-.54	.22	
ln_odaplus_nonhealth_pub_gdp	-.09	.56	-0.17	.87	-1.21	1.02	
ln_odaplus_nonhealth_civpriv_gdp	.6	.5	1.19	.24	-.4	1.6	
ln_debt_serv_gdp	.28	.3	0.93	.35	-.32	.88	
ln_debt_stock_gdp	-.45	.78	-0.58	.56	-1.99	1.09	
imf_cond_ba1tot	.01	.01	1.15	.25	-.01	.04	
imf_part	-1.13	.51	-2.21	.03	-2.14	-.12	**
ln_gdp_cap_c	2.23	2.4	0.93	.36	-2.53	7	
imr	-.05	.07	-0.73	.47	-.19	.09	
gov_eff	-2.29	1.5	-1.53	.13	-5.27	.68	
corr_control	2.52	1.85	1.36	.18	-1.15	6.2	
battle_dum	.21	.58	0.37	.71	-.93	1.35	
col_indfrom_uk	.72	1.18	0.61	.54	-1.61	3.06	
col_indfrom_fra	.24	1.03	0.23	.82	-1.8	2.28	
col_indfrom_spa	1.61	1.86	0.86	.39	-2.09	5.3	
Mean dependent var		40.225	SD dependent var		19.033		
Number of obs		1443	F-test		985.136		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 73
Lag limit (years): 3
AB test (AR2) (p-value): 0.192
Hansen test (p-value): 0.430
Difference-in-Hansen test (p-value): 0.768

Model 4

ln_ghes_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ghes_dp	.82	.07	12.32	0	.69	.95	***
ln_odaplus_health_pub_gdp	.01	.01	1.35	.18	0	.02	
ln_odaplus_health_civpriv_gdp	0	.01	0.03	.97	-.02	.02	
ln_odaplus_nonhealth_pub_gdp	0	.02	-0.09	.93	-.04	.03	
ln_odaplus_nonhealth_civpriv_gdp	.01	.02	0.75	.45	-.02	.05	
ln_debt_serv_gdp	.02	.01	1.60	.11	0	.04	
ln_debt_stock_gdp	0	.03	-0.17	.87	-.06	.05	
imf_cond_ba1tot	0	0	0.02	.98	0	0	
imf_part	-.01	.02	-0.56	.58	-.05	.03	
ln_gdp_cap_c	.09	.07	1.20	.23	-.06	.24	

imr	0	0	-1.18	.24	-.01	0
gov_eff	-.04	.05	-0.83	.41	-.14	.06
corr_control	.01	.06	0.21	.83	-.11	.14
battle_dum	.03	.03	1.26	.21	-.02	.09
col_indfrom_uk	-.01	.04	-0.16	.87	-.09	.07
col_indfrom_fra	-.04	.04	-0.92	.36	-.13	.05
col_indfrom_spa	.03	.04	0.69	.49	-.05	.11
Mean dependent var		0.560	SD dependent var		0.721	
Number of obs		1443	F-test		377.266	

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 73
Lag limit (years): 3
AB test (AR2) (p-value): 0.458
Hansen test (p-value): 0.357
Difference-in-Hansen test (p-value): 0.397

- Reduced models:

Model 1a

oop_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. oop_che	.68	.06	10.98	0	.55	.8	***
ln_odaplus_health_pub_gdp	-.03	.26	-0.13	.89	-.55	.48	
ln_odaplus_health_civpriv_gdp	-.09	.24	-0.39	.7	-.57	.38	
ln_debt_serv_gdp	.18	.57	0.31	.76	-.96	1.31	
ln_ghes_gdp	-7.9	1.49	-5.31	0	-10.85	-4.95	***
ln_gdp_cap_c	.29	2.05	0.14	.89	-3.79	4.36	
imr	-.13	.05	-2.36	.02	-.23	-.02	**
gov_eff	.36	1.2	0.30	.76	-2.02	2.75	
corr_control	-.73	2.05	-0.35	.72	-4.79	3.34	
battle_dum	.51	.81	0.63	.53	-1.1	2.12	
col_indfrom_uk	-2.72	1.91	-1.42	.16	-6.5	1.07	
col_indfrom_fra	-.36	1.82	-0.20	.84	-3.97	3.25	
col_indfrom_spa	.59	1.45	0.41	.68	-2.29	3.47	
Mean dependent var		40.102	SD dependent var		19.365		
Number of obs		1443	F-test		483.073		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 87
Lag limit (years): 6
AB test (AR2) (p-value): 0.926
Hansen test (p-value): 0.301
Difference-in-Hansen test (p-value): 0.228

Model 2a

ln_oop_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ln_oop_gdp	.92	.06	14.83	0	.8	1.05	***
ln_odaplus_health_pub_gdp	-.01	.01	-1.22	.22	-.03	.01	
ln_odaplus_health_civpriv_gdp	-.01	.01	-0.71	.48	-.02	.01	
ln_odaplus_nonhealth_civpriv_gdp	.02	.02	1.30	.2	-.01	.06	
ln_ghes_gdp	.11	.04	2.47	.02	.02	.19	**
ln_gdp_cap_c	-.14	.07	-1.87	.06	-.28	.01	*
imr	0	0	-0.88	.38	-.01	0	

gov_eff	.05	.06	0.97	.34	-.06	.17
corr_control	-.03	.06	-0.41	.68	-.15	.1
battle_dum	.03	.02	1.42	.16	-.01	.08
col_indfrom_uk	-.04	.06	-0.74	.46	-.15	.07
col_indfrom_fra	.03	.06	0.59	.56	-.08	.15
col_indfrom_spa	.05	.08	0.70	.48	-.1	.21
Mean dependent var		0.550	SD dependent var		0.733	
Number of obs		1443	F-test		128.934	

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 87
Lag limit (years): 6
AB test (AR2) (p-value): 0.518
Hansen test (p-value): 0.182
Difference-in-Hansen test (p-value): 0.375

Model 3a

ghes_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ghes_che	.71	.08	9.12	0	.56	.87	***
L2. ghes_che	.22	.08	2.92	0	.07	.37	***
ln_odaplus_nonhealth_civpriv_gdp	-.28	.52	-0.53	.6	-1.32	.76	
ln_debt_serv_gdp	.05	.34	0.14	.89	-.62	.72	
ln_gdp_cap_c	-.18	2.32	-0.08	.94	-4.78	4.42	
imr	-.03	.06	-0.51	.61	-.15	.09	
gov_eff	-1.28	1.31	-0.98	.33	-3.88	1.31	
corr_control	2.82	1.55	1.81	.07	-.26	5.89	*
battle_dum	-.21	.54	-0.39	.7	-1.28	.86	
col_indfrom_uk	.22	.89	0.24	.81	-1.55	1.99	
col_indfrom_fra	.35	.93	0.38	.71	-1.5	2.2	
col_indfrom_spa	1.42	1.03	1.37	.17	-.63	3.46	
Mean dependent var		40.566	SD dependent var		19.169		
Number of obs		1356	F-test		2714.024		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 88
Lag limit (years): 8
AB test (AR2) (p-value): 0.647
Hansen test (p-value): 0.225
Difference-in-Hansen test (p-value): 0.721

Model 4a

ln_ghes_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ln_ghes_gdp	.74	.09	7.92	0	.55	.92	***
ln_odaplus_health_pub_gdp	.01	.01	0.64	.52	-.01	.02	
ln_gdp_cap_c	.21	.1	1.99	.05	0	.41	**
imr	0	0	0.42	.67	0	.01	
gov_eff	-.04	.06	-0.61	.54	-.15	.08	
corr_control	.03	.07	0.42	.68	-.12	.18	
battle_dum	.03	.03	1.03	.31	-.03	.09	
col_indfrom_uk	-.04	.06	-0.73	.47	-.15	.07	
col_indfrom_fra	-.11	.07	-1.49	.14	-.26	.04	
col_indfrom_spa	-.02	.07	-0.35	.73	-.16	.11	
Mean dependent var		0.563	SD dependent var		0.721		
Number of obs		1460	F-test		241.976		

*** p<.01, ** p<.05, * p<.1

Countries: 105
Instrument count: 73
Lag limit (years): 7
AB test (AR2) (p-value): 0.200
Hansen test (p-value): 0.230
Difference-in-Hansen test (p-value): 0.317

Two lags on independent variables of interest:

- Full models (only significant variations shown):

Model 2

ln_oop_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ln_oop_gdp	.93	.07	12.62	0	.78	1.08	***
L2. ln_odaplus_health_pub_gdp	-.02	.01	-1.95	.05	-.04	0	*
L2. ln_odaplus_health_civpriv_gdp	-.01	.01	-1.56	.12	-.03	0	
L2. ln_odaplus_nonhealth_pub_gdp	.01	.01	0.91	.37	-.02	.04	
L2. ln_odaplus_nonhealth_civpriv_gdp	-.03	.01	-2.52	.01	-.06	-.01	**
ln_debt_serv_gdp	0	.02	-0.03	.98	-.03	.03	
ln_debt_stock_gdp	.02	.04	0.52	.6	-.06	.1	
imf_cond_ba1tot	0	0	-0.68	.5	0	0	
imf_part	.02	.03	0.96	.34	-.03	.07	
ln_ghes_gdp	.07	.06	1.16	.25	-.05	.18	
ln_gdp_cap_c	-.22	.11	-1.97	.05	-.45	0	*
imr	0	0	-1.31	.19	-.01	0	
gov_eff	.03	.06	0.50	.62	-.09	.14	
corr_control	-.01	.08	-0.16	.87	-.16	.14	
battle_dum	.02	.02	0.85	.4	-.03	.07	
col_indfrom_uk	.03	.06	0.49	.63	-.09	.15	
col_indfrom_fra	.05	.06	0.79	.43	-.07	.16	
col_indfrom_spa	.06	.06	0.93	.36	-.06	.18	
Mean dependent var		0.547	SD dependent var		0.733		
Number of obs		1326	F-test		132.998		

*** p<.01, ** p<.05, * p<.1

Countries: 105
Instrument count: 76
Lag limit (years): 3
AB test (AR2) (p-value): 0.567
Hansen test (p-value): 0.151
Difference-in-Hansen test (p-value): 0.330

- Reduced models (only significant variations shown):

Model 2a

ln_oop_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ln_oop_gdp	.94	.05	17.51	0	.84	1.05	***
L2. ln_odaplus_health_pub_gdp	-.02	.01	-2.29	.02	-.04	0	**
L2. ln_odaplus_health_civpriv_gdp	-.02	.01	-2.31	.02	-.03	0	**
ln_odaplus_nonhealth_civpriv_gdp	.01	.02	0.54	.59	-.02	.04	

ln_ghes_gdp	.08	.04	2.08	.04	0	.16	**
ln_gdp_cap_c	-.2	.07	-2.97	0	-.33	-.07	***
imr	0	0	-1.39	.17	-.01	0	
gov_eff	.06	.05	1.15	.25	-.04	.16	
corr_control	-.03	.05	-0.64	.53	-.12	.06	
battle_dum	.04	.02	1.55	.12	-.01	.08	
col_indfrom_uk	0	.05	0.07	.94	-.1	.11	
col_indfrom_fra	.02	.05	0.44	.66	-.08	.12	
col_indfrom_spa	.04	.05	0.86	.39	-.05	.14	
Mean dependent var		0.547	SD dependent var		0.733		
Number of obs		1326	F-test		194.769		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 86
Lag limit (years): 6
AB test (AR2) (p-value): 0.595
Hansen test (p-value): 0.337
Difference-in-Hansen test (p-value): 0.687

Model 4a

ln_ghes_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ln_ghes_gdp	.7	.09	8.02	0	.53	.87	***
L2. ln_odaplus_health_pub_gdp	-.02	.01	-2.21	.03	-.04	0	**
ln_gdp_cap_c	.14	.1	1.44	.15	-.05	.34	
imr	0	0	0.13	.9	-.01	.01	
gov_eff	0	.06	-0.06	.95	-.12	.11	
corr_control	.03	.09	0.29	.77	-.16	.21	
battle_dum	.06	.03	1.70	.09	-.01	.13	*
col_indfrom_uk	-.01	.08	-0.18	.86	-.17	.14	
col_indfrom_fra	-.13	.09	-1.35	.18	-.31	.06	
col_indfrom_spa	-.02	.09	-0.24	.81	-.21	.16	
Mean dependent var		0.571	SD dependent var		0.720		
Number of obs		1356	F-test		111.931		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 72
Lag limit (years): 7
AB test (AR2) (p-value): 0.340
Hansen test (p-value): 0.470
Difference-in-Hansen test (p-value): 0.664

10.4.4.2. Alternative lag limits

The below table shows how changing model lag limits affects the p-value of significant variables identified in our model specifications. P-values less than 0.05 are highlighted in **bold**. Insignificant variables are not shown. Dependent variable lags were significant in all models but not shown. The instrument matrix is collapsed for all specifications:

Model 1)

oop_che	Lag limits					Direction of association
Independent variable	2	3	4	5	6	
L. ln_odaplus_health_civpriv_gdp (p-value)	0.078	0.085	**0.021**	**0.012**	0.076	-
ln_ghes_gdp (p-value)	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	-
imr (p-value)	**0.024**	**0.010**	**0.038**	**0.006**	**0.011**	-
Hansen-test p-value	0.206	0.506	0.262	0.558	0.856	
Instrument count	62	77	92	107	122	

Model 2)

ln_oop_gdp	Lag limits					Direction of association
Independent variable	2	3	4	5	6	
L. ln_odaplus_health_pub_gdp (p-value)	0.227	0.082	0.086	0.099	**0.027**	-
L. ln_odaplus_health_civpriv_gdp (p-value)	0.107	0.078	0.050	**0.005**	**0.028**	-
ln_ghes_gdp (p-value)	**0.018**	0.063	0.092	0.105	0.067	+
ln_gdp_cap_c (p-value)	0.057	**0.019**	**0.029**	**0.012**	**0.002**	-
Hansen-test p-value	0.052	0.113	0.366	0.546	0.869	
Instrument count	62	77	92	107	122	

Model 3)

None significant

Model 4)

ln_ghes_gdp	Lag limits					Direction of association
Independent variable	2	3	4	5	6	
ln_odaplus_health_pub_gdp (p-value)	0.128	0.062	0.075	**0.008**	**0.035**	-
Hansen-test p-value	0.153	0.592	0.615	0.480	0.670	
Instrument count	59	73	87	101	115	

Model 1a)

oop_che	Lag limits					Direction of association
Independent variable	3	4	5	6	7	
L. ln_debt_serv_gdp (p-value)	0.066	0.060	**0.041**	0.065	0.060	+
ln_ghes_gdp (p-value)	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	-
imr (p-value)	**0.011**	**0.013**	**0.008**	**0.005**	**0.006**	-
Hansen-test p-value	0.224	0.194	0.402	0.624	0.493	
Instrument count	57	67	77	78	97	

Model 2a)

ln_oop_gdp	Lag limits					Direction of association
Independent variable	5	6	7	8	9	
L. ln_odaplus_health_pub_gdp (p-value)	0.107	0.061	**0.017**	**0.007**	**0.002**	-
L. ln_odaplus_health_civpriv_gdp (p-value)	**0.048**	0.092	**0.047**	**0.036**	0.067	-
L. ln_odaplus_nonhealth_civpriv_gdp (p-value)	0.121	0.050	**0.037**	0.061	0.097	-
ln_ghes_gdp (p-value)	0.085	**0.030**	**0.048**	**0.039**	**0.016**	+
ln_gdp_cap_c (p-value)	**0.030**	**0.004**	**0.001**	**0.000**	**0.001**	-
Hansen-test p-value	0.263	0.330	0.469	0.403	0.803	
Instrument count	77	87	97	107	117	

Model 3a)

ghes_che	Lag limits					Direction of association
Independent variable	6	7	8	9	10	
L. ln_debt_serv_gdp (p-value)	0.061	0.101	**0.023**	**0.038**	**0.042**	-
corr_control (p-value)	0.075	0.111	**0.017**	**0.010**	**0.027**	+
Hansen-test p-value	0.224	0.296	0.242	0.223	0.211	
Instrument count	72	80	88	96	109	

Model 4a)

ln_ghes_gdp	Lag limits					Direction of association
Independent variable	5	6	7	8	9	
ln_odaplus_health_pub_gdp (p-value)	0.082	0.065	**0.045**	**0.037**	0.143	-
col_indfrom_fra (p-value)	0.370	0.247	0.191	0.107	**0.049**	-
Hansen-test p-value	0.334	0.283	0.346	0.302	0.309	
Instrument count	59	66	77	80	87	

We also examined the sensitivity of our findings for IMF participation in a contemporaneous version of model 3:

Model 3, contemporaneous specification

ln_ghes_che	Lag limits					Direction of association
Independent variable	2	3	4	5	6	
imf_part (p-value)	0.389	**0.029**	**0.036**	**0.042**	0.085	-
Hansen-test p-value	0.359	0.430	0.302	0.450	0.829	
Instrument count	59	73	87	101	115	

10.4.4.3. Alternative variables

The below table displays the sensitivity of our findings to swapping variables with alternative variables. Only significant variables shown. Lagged dependent variables significant in all models but not shown for brevity. Year dummies included in all models but not shown for brevity. Per GDP to per cap: All financial variables measured per GDP swapped to per capita, including dependent variables. IMR: Infant Mortality Rate. U5MR: Under-5-Mortality Rate. Cond: Conditionality variable (imf_cond_ba1tot swapped for imf_cond_ba2tot and imf_cond_ba3tot). Colony: Country colonial independence was obtained from. SSA: Sub-Saharan Africa. WB Inc: World Bank Income Group.

Italic used to highlight problematically high instrument counts necessary to maintain acceptable test statistics in alternative model, or problematically high Hansen-test p-values.

Model 1

oop_che Original variable: New variable:	IMR U5MR	IMR MMR	Cond. 1 Cond. 2	Cond. 1 Cond. 3	Colony -	Colony WB Inc.	Colony SSA	Per GDP Per cap.*	Direction of association
L. ln_odaplus_health_civpriv_gdp (p-value)	**0.009**	**0.013**	**0.039**	**0.028**	**0.027**	0.069	**0.034**	**0.023**	-
ln_ghes_gdp (p-value)	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	-
ln_gdp_cap_c (p-value)	0.611	0.281	0.943	0.957	0.762	0.269	0.849	**0.005**	+
imr (p-value)	0.219	0.713	**0.041**	**0.038**	**0.029**	**0.033**	0.076	0.088	-
Hansen-test p-value	0.172	0.124	0.205	0.242	0.158	0.154	0.163	0.294	
Instrument count	92	92	92	92	89	91	90	92	

*Financial independent variables per capita.

Model 2

ln_oop_gdp Original variable: New variable:	IMR U5MR	IMR MMR	Cond. 1 Cond. 2	Cond. 1 Cond. 3	Colony -	Colony WB Inc.	Colony SSA	Per GDP Per cap.*	Direction of association
L. ln_odaplus_health_civpriv_gdp	0.080	0.081	**0.043**	**0.046**	**0.028**	0.068	**0.032**	0.210	-
ln_gdp_cap_c (p-value)	**0.045**	**0.049**	**0.031**	**0.029**	**0.014**	0.102	**0.019**	**0.037**	+
imr (p-value)	0.639	0.862	0.335	0.344	0.198	0.389	0.076	**0.027**	-
corr_control	0.746	0.523	0.772	0.789	0.814	0.807	0.673	**0.036**	+
Hansen-test p-value	0.342	0.124	0.368	0.371	0.358	0.289	0.371	0.180	
Instrument count	92	92	92	92	89	91	90	*107*	

*Both dependent variable and financial independent variables per capita.

Model 3)

None significant.

Model 4

ln_ghes_gdp Original variable: New variable:	IMR U5MR	IMR MMR	Cond. 1 Cond. 2	Cond. 1 Cond. 3	Colony -	Colony WB Inc.	Colony SSA	Per GDP Per cap.*	Direction of association
L. ln_odaplus_health_pub_gdp	**0.040**	**0.049**	**0.041**	**0.042**	0.053	0.072	**0.018**	0.071	-
L. ln_odaplus_nonhealth_pub_gdp	0.756	0.567	0.870	0.805	0.786	0.778	0.762	**0.019**	+
ln_gdp_cap_c (p-value)	0.299	0.104	0.341	0.393	0.238	0.366	0.333	**0.000**	+
Hansen-test p-value	*0.600*	0.575	0.565	0.553	*0.631*	*0.619*	*0.651*	0.166	
Instrument count	73	73	73	73	70	72	71	73	

*Both dependent variable and financial independent variables per capita.

Model 1a

oop_che Original variable: New variable:	IMR U5MR	IMR MMR	Colony -	Colony WB Inc.	Colony SSA	Per GDP Per cap.*	Direction of association
L. ln_debt_serv_gdp (p-value)	0.062	0.076	**0.036**	**0.017**	**0.037**	0.151	+
ln_ghes_gdp (p-value)	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	-
ln_gdp_cap_c (p-value)	0.893	0.874	0.528	0.604	0.485	**0.018**	+
imr (p-value)	0.138	0.638	**0.005**	**0.013**	**0.015**	**0.021**	-
Hansen-test p-value	0.367	0.238	0.400	0.310	0.404	0.396	
Instrument count	97	97	97	74	75	77	

*Financial independent variables per capita.

Model 2a

ln_oop_gdp Original variable: New variable:	IMR U5MR	IMR MMR	Colony -	Colony WB Inc.	Colony SSA	Per GDP Per cap.*	Direction of association
L. ln_odaplus_health_pub_gdp	**0.022**	**0.031**	**0.020**	0.062	**0.023**	0.759	-
L. ln_odaplus_health_civpriv_gdp	**0.018**	**0.024**	**0.024**	**0.015**	**0.040**	0.717	-
L. ln_odaplus_nonhealth_civpriv_gdp	**0.040**	**0.031**	**0.033**	**0.011**	**0.040**	0.334	-
ln_ghes_gdp	**0.044**	0.071	**0.082**	0.386	0.067	0.440	+
ln_gdp_cap_c	**0.006**	**0.008**	**0.001**	0.094	**0.001**	0.139	-
imr (p-value)	0.138	0.638	0.072	**0.013**	0.179	**0.002**	-
Hansen-test p-value	0.473	0.467	0.438	0.194	0.465	0.195	
Instrument count	97	97	94	96	95	*107*	

*Both dependent variable and financial independent variables per capita.

Model 3a

ghes_che Original variable: New variable:	IMR U5MR	IMR MMR	Colony -	Colony WB Inc.	Colony SSA	Per GDP Per cap.*	Direction of association
L. ln_debt_serv_gdp	**0.022**	**0.014**	**0.019**	**0.012**	**0.028**	**0.020**	-
corr_control	**0.015**	**0.009**	**0.037**	0.269	0.077	**0.017**	+

Hansen-test p-value	0.268	0.242	0.219	0.202	0.219	0.208	
Instrument count	88	88	85	94	86	88	

*Financial independent variables per capita.

Model 4a

ln_ghes_gdp Original variable: New variable:	IMR U5MR	IMR MMR	Colony -	Colony WB Inc.	Colony SSA	Per GDP Per cap.*	Direction of association
L. ln_odaplus_health_pub_gdp	**0.034**	**0.025**	**0.037**	**0.035**	**0.017**	0.229	-
ln_gdp_cap_c	0.157	**0.113**	0.158	0.182	0.220	**0.000**	+
Hansen-test p-value	0.268	0.413	0.290	0.265	0.323	0.341	
Instrument count	73	73	70	72	71	*108*	

*Both dependent variable and financial independent variables per capita.

We also examined the sensitivity of our findings for IMF participation in a contemporaneous version of model 3:

Model 3, contemporaneous specification

ln_ghes_che Original variable: New variable:	IMR U5MR	IMR MMR	Colony -	Colony WB Inc.	Colony SSA	Per GDP Per cap.*	Direction of association
imf_part	**0.025**	0.080	**0.024**	**0.030**	**0.025**	**0.033**	-
Hansen-test p-value	0.474	*0.619*	0.437	0.441	0.397	0.480	
Instrument count	73	73	70	72	71	73	

*Financial independent variables per capita.

10.4.4.4. Interaction terms

Only models with significant interaction terms displayed. Year dummies included in all models but not shown for brevity. Problematic diagnostic test statistics highlighted in italic.

- Region being Sub-Saharan Africa:

Model 3a

ghes_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ghes_che	.72	.07	10.13	0	.58	.86	***
L2. ghes_che	.24	.07	3.35	0	.1	.38	***
L. ln_odaplus_nonhealth_civpriv_gdp	-.06	.43	-0.14	.89	-.91	.79	
reg_ssf*L.ln_odaplus_nonhealth_civpriv_gdp	2.37	.75	3.15	0	.88	3.86	***
L. ln_debt_serv_gdp	-.56	.48	-1.17	.24	-1.5	.38	
reg_ssf*ln_debt_serv_gdp	.02	.56	0.04	.97	-1.08	1.12	
ln_gdp_cap_c	.88	2.6	0.34	.74	-4.27	6.03	
imr	-.04	.06	-0.57	.57	-.16	.09	
gov_eff	-1.02	1.26	-0.81	.42	-3.53	1.48	
corr_control	2.81	1.64	1.72	.09	-.43	6.06	*
battle_dum	-.36	.67	-0.54	.59	-1.7	.97	
reg_ssf	3.26	1.93	1.69	.09	-.56	7.08	*
Mean dependent var		40.566	SD dependent var		19.169		
Number of obs		1356	F-test		2080.197		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 94
Lag limit (years): 7
AB test (AR2) (p-value): 0.693
Hansen test (p-value): 0.303
Difference-in-Hansen test (p-value): 0.804

- World Bank income group being low-income:

This model is possibly overspecified, and the two significant interaction terms become insignificant with any lag limit change.

Model 4

ln_ghes_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ln_ghes_gdp	.97	.05	18.03	0	.87	1.08	***
L. ln_odaplus_health_pub_gdp	-.01	.01	-1.49	.14	-.03	0	
inc_lic* L.ln_odaplus_health_pub_gdp	-.07	.03	-2.13	.04	-.13	0	**
L. ln_odaplus_health_civpriv_gdp	0	.01	-0.14	.89	-.02	.01	
inc_lic* L.ln_odaplus_health_civpriv_gdp	.06	.02	2.93	0	.02	.1	***
L. ln_odaplus_nonhealth_pub_gdp	0	.02	0.04	.97	-.03	.03	
L. ln_odaplus_nonhealth_civpriv_gdp	.02	.02	1.11	.27	-.02	.06	
L. ln_debt_serv_gdp	-.01	.01	-0.49	.63	-.03	.02	
L. ln_debt_stock_gdp	-.02	.03	-0.63	.53	-.07	.04	
imf_cond_ba1tot	0	0	0.08	.94	0	0	
imf_part	0	.02	-0.10	.92	-.05	.04	

ln_gdp_cap_c	-.05	.11	-0.47	.64	-.27	.16
imr	0	0	0.10	.92	-.01	.01
gov_eff	.06	.05	1.19	.24	-.04	.15
corr_control	.05	.05	1.02	.31	-.05	.16
battle_dum	.03	.03	1.08	.28	-.02	.08
inc_lic	-.05	.1	-0.49	.62	-.24	.15
Mean dependent var		0.557	SD dependent var		0.723	
Number of obs		1429	F-test		571.200	

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 77
Lag limit (years): 3
AB test (AR2) (p-value): 0.418
Hansen test (p-value): *0.679*
Difference-in-Hansen test (p-value): 0.306

10.4.4.5. No log-transformation

Year dummies included in all models but not shown for brevity. Problematic diagnostic tests and instrument counts highlighted in italic. Shown models have "cherry-picked" lag-structures, looking for significance (confirmation bias).

Model 1

We were unable to produce a specification that convincingly passes all diagnostic tests and where instruments do not outnumber groups. Below is for "cherry-picked" variable lag-specification, looking for significance (confirmation bias). Model is overspecified and becomes invalid at lower instrument counts. Findings for debt variables disappear at different ODA+ lag-specifications.

oop_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. oop_che	.72	.06	11.54	0	.59	.84	***
L. odaplus_health_pub_gdp	-.51	.8	-0.64	.53	-2.1	1.08	
L. odaplus_health_civpriv_gdp	-2.38	2.08	-1.15	.25	-6.5	1.74	
odaplus_nonhealth_pub_gdp	-.1	.14	-0.71	.48	-.37	.17	
odaplus_nonhealth_civpriv_gdp	-.44	.81	-0.55	.59	-2.05	1.16	
debt_serv_gdp	-.19	.09	-2.07	.04	-.37	-.01	**
debt_stock_gdp	.06	.03	2.32	.02	.01	.12	**
imf_cond_ba1tot	0	.01	-0.34	.74	-.03	.02	
imf_part	.83	.62	1.33	.19	-.4	2.05	
ghes_gdp	-3.38	.83	-4.07	0	-5.02	-1.73	***
gdp_cap_c	0	0	-0.53	.6	0	0	
imr	-.13	.05	-2.49	.01	-.23	-.03	**
gov_eff	-1.25	1.56	-0.80	.42	-4.33	1.84	
corr_control	-.99	1.77	-0.56	.58	-4.51	2.52	
battle_dum	.67	.85	0.79	.43	-1.01	2.35	
col_indfrom_uk	-1.97	1.56	-1.26	.21	-5.06	1.12	
col_indfrom_fra	-1.24	1.72	-0.72	.47	-4.65	2.17	
col_indfrom_spa	.66	1.65	0.40	.69	-2.61	3.93	
Mean dependent var		40.183	SD dependent var		19.385		
Number of obs		1433	F-test		391.839		

*** p<.01, ** p<.05, * p<.1

Countries: 105
Instrument count: *107*
Lag limit (years): 5
AB test (AR2) (p-value): 1.000
Hansen test (p-value): 0.186
Difference-in-Hansen test (p-value): 0.230

Model 2

oop_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. oop_gdp	.79	.09	8.97	0	.62	.97	***
L. odaplus_health_pub_gdp	-.09	.04	-2.11	.04	-.17	0	**
odaplus_health_civpriv_gdp	-.02	.17	-0.12	.9	-.36	.32	
L. odaplus_nonhealth_pub_gdp	.01	.01	0.47	.64	-.02	.03	
odaplus_nonhealth_civpriv_gdp	.11	.06	1.90	.06	0	.23	*
L. debt_serv_gdp	-.01	.02	-0.58	.56	-.04	.02	
L. debt_serv_gdp	0	0	-0.70	.49	0	0	
L2. imf_cond_ba1tot	0	0	-1.51	.13	0	0	
L2. imf_part	.17	.05	3.46	0	.07	.27	***
ghes_gdp	.02	.05	0.41	.68	-.07	.11	

gdp_cap_c	0	0	-1.14	.26	0	0	
imr	0	0	-1.10	.27	-.01	0	
gov_eff	.17	.14	1.26	.21	-.1	.45	
corr_control	-.26	.22	-1.16	.25	-.7	.18	
battle_dum	.13	.06	2.15	.03	.01	.24	**
col_indfrom_uk	-.08	.1	-0.79	.43	-.28	.12	
col_indfrom_fra	-.06	.1	-0.59	.56	-.26	.14	
col_indfrom_spa	-.06	.17	-0.35	.72	-.4	.28	
Mean dependent var		2.146	SD dependent var		1.342		
Number of obs		1347	F-test		287.666		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 91
Lag limit (years): 4
AB test (AR2) (p-value): 0.541
Hansen test (p-value): 0.235
Difference-in-Hansen test (p-value): 0.714

Model 3

ghes_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ghes_che	.84	.08	11.00	0	.69	.99	***
L. odaplus_health_pub_gdp	-.86	.66	-1.30	.2	-2.16	.45	
odaplus_health_civ_priv_gdp	.75	1.1	0.68	.5	-1.44	2.93	
L. odaplus_nonhealth_pub_gdp	-.03	.08	-0.39	.7	-.2	.13	
odaplus_nonhealth_civpriv_gdp	-.28	.47	-0.59	.55	-1.2	.65	
L. debt_serv_gdp	-.04	.1	-0.41	.68	-.25	.16	
L. debt_stock_gdp	-.06	.02	-2.46	.02	-.1	-.01	**
imf_cond_ba1tot	.01	.01	1.33	.19	-.01	.04	
imf_part	-.99	.58	-1.70	.09	-2.14	.17	*
gdp_cap_c	0	0	1.02	.31	0	0	
imr	-.05	.05	-0.84	.4	-.15	.06	
gov_eff	-1.21	1.3	-0.92	.36	-3.79	1.38	
corr_control	2.21	2.03	1.09	.28	-1.81	6.24	
battle_dum	.4	.6	0.67	.5	-.78	1.58	
col_indfrom_uk	-.03	1.38	-0.02	.98	-2.78	2.71	
col_indfrom_fra	-.3	1.38	-0.22	.83	-3.04	2.43	
col_indfrom_spa	.56	1.67	0.33	.74	-2.76	3.88	
Mean dependent var		40.261	SD dependent var		19.024		
Number of obs		1447	F-test		667.835		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 73
Lag limit (years): 3
AB test (AR2) (p-value): 0.190
Hansen test (p-value): 0.378
Difference-in-Hansen test (p-value): 0.680

Model 4

ghes_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ghes_gdp	.89	.04	21.29	0	.81	.98	***
L. odaplus_health_pub_gdp	-.05	.03	-1.44	.15	-.11	.02	
odaplus_health_civpriv_gdp	.17	.08	2.12	.04	.01	.32	**
L2. odaplus_nonhealth_pub_gdp	0	.01	-0.50	.62	-.01	.01	
odaplus_nonhealth_civpriv_gdp	.01	.03	0.47	.64	-.05	.08	
L. debt_serv_gdp	0	.01	0.13	.89	-.01	.02	
L. debt_stock_gdp	0	0	0.23	.82	0	0	
L. imf_cond_ba1tot	0	0	-0.90	.37	0	0	
L. imf_part	.05	.05	1.03	.31	-.05	.15	
gdp_cap_c	0	0	-0.03	.98	0	0	
imr	0	0	-0.91	.37	-.01	0	
gov_eff	.07	.09	0.79	.43	-.11	.26	
corr_control	.13	.1	1.23	.22	-.08	.33	
battle_dum	.01	.04	0.38	.71	-.06	.09	
col_indfrom_uk	-.01	.06	-0.18	.86	-.14	.12	
col_indfrom_fra	0	.05	0.06	.95	-.1	.11	
col_indfrom_spa	.17	.1	1.61	.11	-.04	.37	
Mean dependent var		2.225	SD dependent var		1.429		
Number of obs		1347	F-test		1114.232		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 86
Lag limit (years): 4
AB test (AR2) (p-value): 0.535
Hansen test (p-value): 0.204
Difference-in-Hansen test (p-value): 0.779

Model 1a

oop_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. oop_che	.72	.05	13.28	0	.62	.83	***
L2. odaplus_health_pub_gdp	.05	.7	0.08	.94	-1.34	1.45	
L. odaplus_health_civpriv_gdp	-3.68	2.76	-1.33	.19	-9.16	1.79	
L2. debt_serv_gdp	.14	.13	1.08	.28	-.11	.39	
ghes_gdp	-3.5	.83	-4.19	0	-5.15	-1.84	***
gdp_cap_c	0	0	0.06	.95	0	0	
imr	-.15	.05	-2.97	0	-.25	-.05	***
gov_eff	-.2	1.5	-0.13	.89	-3.18	2.78	
corr_control	-3.95	1.97	-2.01	.05	-7.85	-.06	**
battle_dum	.29	.64	0.45	.65	-.98	1.55	
col_indfrom_uk	-1.85	1.36	-1.36	.18	-4.55	.86	
col_indfrom_fra	-.81	1.45	-0.56	.58	-3.69	2.07	
col_indfrom_spa	-.91	1.77	-0.51	.61	-4.42	2.6	
Mean dependent var		39.858	SD dependent var		19.368		
Number of obs		1343	F-test		553.256		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 96
Lag limit (years): 7
AB test (AR2) (p-value): 0.732
Hansen test (p-value): 0.332
Difference-in-Hansen test (p-value): 0.832

Model 2a

oop_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. oop_gdp	.74	.11	6.43	0	.51	.96	***
L2. odaplus_health_pub_gdp	-.12	.06	-1.99	.05	-.25	0	**
L2. odaplus_health_civpriv_gdp	-.02	.13	-0.15	.88	-.27	.23	
odaplus_nonhealth_civpriv_gdp	.11	.05	2.12	.04	.01	.21	**
ghes_gdp	-.03	.05	-0.60	.55	-.12	.06	
gdp_cap_c	0	0	-1.96	.05	0	0	*
imr	0	0	-1.29	.2	-.01	0	
gov_eff	.1	.1	1.00	.32	-.1	.31	
corr_control	-.12	.17	-0.71	.48	-.47	.22	
battle_dum	.1	.07	1.53	.13	-.03	.24	
col_indfrom_uk	-.21	.14	-1.48	.14	-.48	.07	
col_indfrom_fra	-.13	.14	-0.94	.35	-.4	.14	
col_indfrom_spa	-.05	.21	-0.25	.81	-.47	.36	
Mean dependent var		2.157	SD dependent var		1.347		
Number of obs		1330	F-test		225.319		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 86
Lag limit (years): 6
AB test (AR2) (p-value): 0.590
Hansen test (p-value): 0.337
Difference-in-Hansen test (p-value): 0.384

Model 3a

ghes_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ghes_che	.74	.08	9.15	0	.58	.89	***
L2. ghes_che	.2	.07	2.69	.01	.05	.34	***
odaplus_nonhealth_civpriv_gdp	-1.13	.51	-2.20	.03	-2.14	-.11	**
debt_serv_gdp	-.02	.09	-0.17	.86	-.2	.17	
gdp_cap_c	0	0	1.35	.18	0	0	
imr	.01	.06	0.08	.93	-.11	.12	
gov_eff	-1.4	1.12	-1.25	.21	-3.61	.82	
corr_control	1.5	1.84	0.82	.42	-2.14	5.14	
battle_dum	-.19	.54	-0.35	.73	-1.25	.88	
col_indfrom_uk	.02	.87	0.02	.98	-1.71	1.75	
col_indfrom_fra	-.15	.69	-0.22	.83	-1.51	1.21	
col_indfrom_spa	.06	1.24	0.05	.96	-2.41	2.53	
Mean dependent var		40.566	SD dependent var		19.169		
Number of obs		1356	F-test		2750.879		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 64
Lag limit (years): 5
AB test (AR2) (p-value): 0.558
Hansen test (p-value): 0.191
Difference-in-Hansen test (p-value): 0.787

Model 4a

ghes_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ghes_gdp	.95	.05	20.53	0	.86	1.04	***
L. odaplus_health_pub_gdp	.07	.09	0.81	.42	-.11	.25	
gdp_cap_c	0	0	-0.26	.79	0	0	
imr	0	0	-1.16	.25	-.01	0	
gov_eff	.05	.08	0.65	.51	-.1	.2	
corr_control	.06	.09	0.67	.51	-.12	.25	
battle_dum	.03	.04	0.83	.41	-.05	.12	
col_indfrom_uk	0	.05	-0.01	.99	-.1	.1	
col_indfrom_fra	.02	.05	0.44	.66	-.08	.13	
col_indfrom_spa	.09	.08	1.11	.27	-.07	.25	
Mean dependent var		2.210	SD dependent var		1.420		
Number of obs		1460	F-test		1705.671		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 73
Lag limit (years): 7
AB test (AR2) (p-value): *0.085*
Hansen test (p-value): 0.173
Difference-in-Hansen test (p-value): 0.602

10.4.4.6. Aggregate ODA-variables

Year dummies included in all models but not shown for brevity.

Model 1

oop_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. oop_che	.7	.05	14.15	0	.6	.8	***
L. ln_odaplus_health_gdp	-.73	.39	-1.89	.06	-1.5	.04	*
L. ln_odaplus_nonhealth_gdp	.36	.57	0.63	.53	-.77	1.49	
L. ln_debt_serv_gdp	.37	.27	1.34	.18	-.18	.91	
L. ln_debt_stock_gdp	.62	.77	0.80	.42	-.91	2.14	
imf_cond_ba1tot	-.02	.01	-1.33	.19	-.04	.01	
imf_part	.71	.52	1.37	.17	-.32	1.74	
ln_ghes_gdp	-7.55	1.39	-5.43	0	-10.3	-4.79	***
ln_gdp_cap_c	-1.15	1.81	-0.64	.52	-4.74	2.43	
imr	-.12	.05	-2.20	.03	-.22	-.01	**
gov_eff	1.41	1.5	0.94	.35	-1.57	4.39	
corr_control	-.86	1.56	-0.55	.58	-3.95	2.23	
battle_dum	.3	.75	0.40	.69	-1.19	1.79	
col_indfrom_uk	-2.2	1.51	-1.46	.15	-5.21	.8	
col_indfrom_fra	-.73	1.74	-0.42	.68	-4.19	2.73	
col_indfrom_spa	.36	1.68	0.22	.83	-2.97	3.7	
Mean dependent var		39.952	SD dependent var		19.411		
Number of obs		1461	F-test		468.132		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 95
Lag limit (years): 5
AB test (AR2) (p-value): 0.998
Hansen test (p-value): 0.257
Difference-in-Hansen test (p-value): 0.168

Model 2

ln_oop_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ln_oop_gdp	.88	.05	16.69	0	.78	.98	***
L. ln_odaplus_health_gdp	-.03	.01	-2.61	.01	-.06	-.01	**
L. ln_odaplus_nonhealth_gdp	0	.02	-0.08	.94	-.05	.04	
L. ln_debt_serv_gdp	.02	.01	1.17	.25	-.01	.05	
L. ln_debt_stock_gdp	-.02	.02	-0.69	.49	-.06	.03	
imf_cond_ba1tot	0	0	-0.91	.36	0	0	
imf_part	.03	.02	1.52	.13	-.01	.07	
ln_ghes_gdp	.07	.04	1.74	.08	-.01	.14	*
ln_gdp_cap_c	-.17	.07	-2.45	.02	-.32	-.03	**
imr	0	0	-0.78	.44	0	0	
gov_eff	.02	.06	0.43	.67	-.09	.14	
corr_control	.01	.05	0.19	.85	-.1	.12	
battle_dum	.04	.02	1.56	.12	-.01	.08	
col_indfrom_uk	-.04	.05	-0.79	.43	-.14	.06	
col_indfrom_fra	0	.06	0.06	.95	-.11	.12	
col_indfrom_spa	.01	.05	0.16	.88	-.09	.1	
Mean dependent var		0.543	SD dependent var		0.737		
Number of obs		1461	F-test		235.018		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 95
Lag limit (years): 5

AB test (AR2) (p-value): 0.626
Hansen test (p-value): 0.266
Difference-in-Hansen test (p-value): 0.360

Model 3

ghes_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ghes_che	.69	.08	8.26	0	.52	.85	***
L2. ghes_che	.2	.07	2.93	0	.06	.33	***
L. ln_odaplus_health_gdp	-.26	.33	-0.78	.44	-.92	.4	
L. ln_odaplus_nonhealth_gdp	-.83	.51	-1.65	.1	-1.84	.17	
L. ln_debt_serv_gdp	-.23	.27	-0.82	.41	-.77	.32	
L. ln_debt_stock_gdp	.43	.73	0.59	.56	-1.02	1.88	
imf_cond_ba1tot	0	.01	0.03	.98	-.02	.03	
imf_part	-.75	.63	-1.19	.24	-2	.5	
ln_gdp_cap_c	-.43	2.43	-0.18	.86	-5.26	4.39	
imr	-.03	.06	-0.52	.61	-.15	.09	
gov_eff	-.63	1.36	-0.47	.64	-3.32	2.06	
corr_control	2.67	2.21	1.21	.23	-1.72	7.06	
battle_dum	-.39	.68	-0.57	.57	-1.74	.96	
col_indfrom_uk	.25	1.05	0.24	.81	-1.84	2.34	
col_indfrom_fra	.65	.95	0.68	.5	-1.24	2.54	
col_indfrom_spa	.3	1.7	0.18	.86	-3.07	3.67	
Mean dependent var		40.566	SD dependent var		19.169		
Number of obs		1356	F-test		1856.911		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 100
Lag limit (years): 6
AB test (AR2) (p-value): 0.593
Hansen test (p-value): 0.301
Difference-in-Hansen test (p-value): 0.450

Model 4

ln_ghes_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ln_ghes_gdp	.76	.08	9.10	0	.59	.92	***
L. ln_odaplus_health_gdp	-.02	.02	-0.94	.35	-.06	.02	
L. ln_odaplus_nonhealth_gdp	.01	.03	0.40	.69	-.04	.06	
L. ln_debt_serv_gdp	-.01	.01	-0.48	.63	-.04	.02	
L. ln_debt_stock_gdp	0	.03	-0.14	.89	-.06	.05	
imf_cond_ba1tot	0	0	0.22	.83	0	0	
imf_part	-.01	.02	-0.23	.82	-.05	.04	
ln_gdp_cap_c	.08	.09	0.95	.34	-.09	.26	
imr	0	0	-0.96	.34	-.01	0	
gov_eff	-.03	.07	-0.42	.67	-.16	.11	
corr_control	.02	.06	0.26	.79	-.1	.13	
battle_dum	.03	.03	0.86	.39	-.04	.09	
col_indfrom_uk	.05	.05	0.93	.36	-.06	.16	
col_indfrom_fra	-.05	.05	-0.99	.32	-.14	.05	
col_indfrom_spa	.04	.06	0.64	.53	-.08	.15	
Mean dependent var		0.563	SD dependent var		0.721		
Number of obs		1461	F-test		222.786		

**** p<.01, ** p<.05, * p<.1*

Countries: 105

Instrument count: 89
Lag limit (years): 5
AB test (AR2) (p-value): 0.179
Hansen test (p-value): 0.246
Difference-in-Hansen test (p-value): 0.204

Model 1a

oop_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. oop_che	.68	.06	11.56	0	.56	.8	***
L. ln_odaplus_health_gdp	-.83	.44	-1.87	.06	-1.71	.05	*
L. ln_odaplus_nonhealth_gdp	-.21	.86	-0.25	.8	-1.92	1.49	
L. ln_debt_serv_gdp	.71	.34	2.08	.04	.03	1.39	**
ln_ghes_gdp	-7.59	1.43	-5.29	0	-10.43	-4.74	***
ln_gdp_cap_c	-2.71	1.94	-1.39	.17	-6.56	1.14	
imr	-.12	.06	-1.96	.05	-.24	0	*
gov_eff	1.8	1.37	1.31	.19	-.92	4.52	
corr_control	-.81	1.67	-0.48	.63	-4.12	2.51	
battle_dum	.01	.72	0.02	.99	-1.42	1.44	
col_indfrom_uk	-2.16	1.8	-1.20	.23	-5.72	1.41	
col_indfrom_fra	-.43	1.85	-0.23	.82	-4.09	3.24	
col_indfrom_spa	.03	1.66	0.02	.98	-3.26	3.33	
Mean dependent var		39.952	SD dependent var		19.411		
Number of obs		1461	F-test		354.401		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 71
Lag limit (years): 5
AB test (AR2) (p-value): 0.965
Hansen test (p-value): 0.507
Difference-in-Hansen test (p-value): 0.313

Model 2a

ln_oop_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ln_oop_gdp	.94	.05	17.38	0	.83	1.05	***
L. ln_odaplus_health_gdp	-.05	.02	-2.86	.01	-.08	-.01	***
L. ln_odaplus_nonhealth_gdp	-.03	.03	-1.20	.23	-.08	.02	
ln_ghes_gdp	.08	.04	1.92	.06	0	.16	*
ln_gdp_cap_c	-.27	.07	-3.93	0	-.41	-.13	***
imr	0	0	-2.15	.03	-.01	0	**
gov_eff	.02	.05	0.37	.71	-.08	.11	
corr_control	.04	.06	0.74	.46	-.07	.15	
battle_dum	.05	.03	2.02	.05	0	.11	**
col_indfrom_uk	.03	.06	0.54	.59	-.08	.14	
col_indfrom_fra	.06	.06	1.06	.29	-.05	.17	
col_indfrom_spa	-.01	.07	-0.15	.88	-.15	.13	
Mean dependent var		0.543	SD dependent var		0.737		
Number of obs		1461	F-test		179.523		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 98
Lag limit (years): 8
AB test (AR2) (p-value): 0.695
Hansen test (p-value): 0.240
Difference-in-Hansen test (p-value): 0.485

Model 3a

L. ln_odaplus_health_gdp added to explore fungibility hypothesis in this model. 2nd-order lag on dependent variable necessary to convincingly pass AB test (AR2).

ghes_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ghes_che	.66	.09	7.78	0	.49	.83	***
L2. ghes_che	.2	.07	3.14	0	.08	.33	***
L. ln_odaplus_health_gdp	-.33	.36	-0.91	.36	-1.06	.39	
L. ln_odaplus_nonhealth_gdp	-.21	.58	-0.36	.72	-1.36	.94	
L. ln_debt_serv_gdp	-.41	.32	-1.30	.2	-1.05	.22	
ln_gdp_cap_c	1.69	2.33	0.73	.47	-2.92	6.3	
imr	.01	.05	0.28	.78	-.09	.12	
gov_eff	-1.34	1.28	-1.04	.3	-3.88	1.21	
corr_control	2.75	1.78	1.55	.13	-.78	6.28	
battle_dum	-.37	.69	-0.55	.59	-1.74	.99	
col_indfrom_uk	.14	.89	0.16	.88	-1.62	1.9	
col_indfrom_fra	-.1	1.02	-0.10	.92	-2.12	1.92	
col_indfrom_spa	.86	1.69	0.51	.61	-2.5	4.21	
Mean dependent var		40.566	SD dependent var		19.169		
Number of obs		1356	F-test		1262.818		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 97
Lag limit (years): 8
AB test (AR2) (p-value): 0.625
Hansen test (p-value): 0.184
Difference-in-Hansen test (p-value): 0.713

Model 4a

ln_ghes_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ln_ghes_gdp	.7	.08	8.60	0	.54	.86	***
L. ln_odaplus_health_gdp	-.05	.03	-1.61	.11	-.11	.01	
ln_gdp_cap_c	.07	.09	0.79	.43	-.11	.25	
imr	0	0	-0.43	.67	-.01	0	
gov_eff	-.05	.07	-0.72	.48	-.18	.08	
corr_control	.05	.08	0.68	.5	-.11	.22	
battle_dum	.04	.03	1.10	.27	-.03	.1	
col_indfrom_uk	.06	.09	0.65	.52	-.11	.22	
col_indfrom_fra	-.08	.06	-1.18	.24	-.2	.05	
col_indfrom_spa	-.03	.08	-0.37	.71	-.2	.14	
Mean dependent var		0.563	SD dependent var		0.721		
Number of obs		1461	F-test		108.486		

**** p<.01, ** p<.05, * p<.1*

Countries: 105
Instrument count: 73
Lag limit (years): 7
AB test (AR2) (p-value): 0.181
Hansen test (p-value): 0.343
Difference-in-Hansen test (p-value): 0.650

10.4.4.7. With Inverse Mills Ratios

Below is shown the results of the used Probit regression of known factors predicting IMF programme participation following the available literature (16, 66-69). Alternative specifications were tested as well, however this model proved superior when weighing predictive capacity, parsimoniousness and data availability.

Probit regression

imf_part	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. imf_part	2.04	.1	20.59	0	1.84	2.23	***
L. cur_acc_bal_gdp	-.02	.01	-3.52	0	-.03	-.01	***
L. res_imp	-.07	.02	-3.25	0	-.12	-.03	***
L. excrate	0	0	-1.79	.07	0	0	*
L. gdp_growth	-.02	.01	-1.77	.08	-.05	0	*
L. ln_gdp_cap_c	-.18	.06	-2.91	0	-.3	-.06	***
L. voice_acc	.1	.09	1.21	.22	-.06	.27	
Constant	.47	.53	0.90	.37	-.56	1.51	

Mean dependent var	0.311	SD dependent var	0.463
Pseudo r-squared	0.458	Number of obs	1245
Chi-square	707.303	Prob > chi2	0.000
Akaike crit. (AIC)	851.934	Bayesian crit. (BIC)	892.949

**** p<.01, ** p<.05, * p<.1*

imf_part is a binary variable capturing IMF programme participation, based on (15), *cur_acc_bal_gdp* is the current account balance in % of GDP (36, 70); *res_imp* is the total reserves in months of imports (36, 70); *excrate* is the official exchange rate in local currency units per US$ (36, 70); *gdp_growth* is GDP growth in % (36); *voice_acc* is Voice and Accountability from the Worldwide Governance Indicators (WGI) dataset (40), measured in standard deviations over a normal distribution. It captures perceptions of to what extent citizens are able to select their government, as well as freedoms of expression, association and media. Other authors (16, 66, 68) have used a Democracy estimate from the Polity5 dataset, however support for this data ended in 2020, and the dataset does not cover 2019 (71). For these reasons, we proxied democracy using the WGI variable, which showed the strongest correlation with IMF programme participation among the six main variables in the dataset.

Similar to Kentikelenis, Stubbs et al. (16, 66), below is shown a classification table illustrating the predictive capacity of the above Probit regression model.

		True		
		+	-	Total
Classified	+	311	79	390
	-	76	779	855
	Total	387	858	1245

This model correctly classified 87.6% of country-year observations:

$$\frac{true\ positives+true\ negatives}{total\ observations} * 100\% = \frac{311+779}{1245} * 100\% = 87.6\%$$

Below is shown regression results from models 1-4 when including Inverse Mills Ratios. Year dummies included in all models but not shown for brevity. Please note: The inclusion of predictive variables for IMF participation lowered the number of countries with data from 105 to 92, and observations from 1429 to 1215. Instrument lag limits were adjusted accordingly to avoid overspecification. Potentially problematic diagnostic test statistics are highlighted in *italic*.

Adding Inverse Mills Ratios to our full models did not cause any substantive changes to our overall results or conclusions. Changes to coefficients and p-values seen were most likely due to the loss of degrees of freedom resulting from the inclusion of new explanatory variables with incomplete data for our Heckman selection model (214 observations and 13 units of observation lost), and the accompanying need to adjust some model lag limits to avoid overspecification. This resulted in the p-value for the relationship between ODA+ for health via civil/private sector per GDP and OOP/CHE being pushed from 0.02 to 0.12, and that for the relationship with OOP/GDP from 0.05 to 0.02. If the two explanatory variables with significant missing data were dropped (current account balance and total reserves), the relationship with OOP/CHE became significant again, with similar predictive capacity of the probit model. The p-value for the relationship between ODA+ for health channelled via the public sector per GDP and GHE-S/GDP went from 0.04 to 0.07, however it regained its significance at 1 deeper lag limit on GMM-style instruments. The negative relationship between IMF participation and GHE-S/CHE in a contemporaneous model became stronger, from -1.13 percentage points to -1.57 percentage points, though still with an insignificant Inverse Mills Ratio. The finding remained sensitive to the lag structure of other variables.

Model 1

oop_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. oop_che	.71	.05	15.53	0	.62	.8	***
L. ln_odaplus_health_pub_gdp	-.4	.35	-1.13	.26	-1.09	.3	
L. ln_odaplus_health_civpriv_gdp	-.3	.19	-1.57	.12	-.69	.08	
L. ln_odaplus_nonhealth_pub_gdp	-.19	.38	-0.49	.62	-.94	.56	
L. ln_odaplus_nonhealth_civpriv_gdp	-.33	.49	-0.66	.51	-1.31	.65	
L. ln_debt_serv_gdp	.39	.31	1.23	.22	-.24	1.01	
L. ln_debt_stock_gdp	.49	.75	0.65	.52	-1.01	1.99	
imf_cond_ba1tot	.01	.01	0.38	.7	-.02	.03	
imf_part	.39	.55	0.70	.48	-.71	1.48	
ln_ghes_gdp	-6.83	1.71	-3.99	0	-10.24	-3.43	***
ln_gdp_cap_c	-.78	1.55	-0.51	.61	-3.86	2.29	
imr	-.15	.06	-2.44	.02	-.27	-.03	**
gov_eff	-.33	1.47	-0.22	.82	-3.25	2.59	
corr_control	-3.2	2.22	-1.44	.15	-7.62	1.21	
battle_dum	.47	.82	0.58	.57	-1.15	2.09	
col_indfrom_uk	-1.65	1.35	-1.22	.22	-4.32	1.03	
col_indfrom_fra	-2.08	1.68	-1.24	.22	-5.41	1.25	
col_indfrom_spa	-2.07	1.72	-1.20	.23	-5.49	1.35	
Inverse Mills Ratio	.06	.26	0.24	.81	-.45	.57	
Mean dependent var		38.611	SD dependent var		19.623		
Number of obs		1215	F-test		497.347		

**** p<.01, ** p<.05, * p<.1*

Countries: 92
Instrument count: 81
Lag limit (years): 3
AB test (AR2) (p-value): .701
Hansen test (p-value): 0.418
Difference-in-Hansen test (p-value): *0.148*

Model 2

ln_oop_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ln_oop_gdp	.89	.06	13.97	0	.77	1.02	***
L. ln_odaplus_health_pub_gdp	-.01	.01	-0.99	.32	-.03	.01	
L. ln_odaplus_health_civpriv_gdp	-.02	.01	-2.32	.02	-.04	0	**
L. ln_odaplus_nonhealth_pub_gdp	-.01	.02	-0.47	.64	-.04	.03	
L. ln_odaplus_nonhealth_civpriv_gdp	-.03	.02	-1.24	.22	-.08	.02	
L. ln_debt_serv_gdp	.03	.02	1.60	.11	-.01	.08	
L. ln_debt_stock_gdp	-.04	.03	-1.45	.15	-.1	.02	
imf_cond_ba1tot	0	0	-0.08	.94	0	0	
imf_part	0	.02	0.11	.92	-.05	.05	
ln_ghes_gdp	.04	.05	0.75	.46	-.06	.13	
ln_gdp_cap_c	-.16	.06	-2.40	.02	-.28	-.03	**
imr	0	0	-0.53	.6	0	0	
gov_eff	-.03	.05	-0.74	.46	-.13	.06	
corr_control	.03	.07	0.38	.71	-.11	.16	
battle_dum	.03	.03	0.93	.35	-.03	.09	
col_indfrom_uk	-.02	.04	-0.65	.52	-.1	.05	
col_indfrom_fra	.02	.06	0.37	.72	-.1	.14	
col_indfrom_spa	-.02	.07	-0.26	.8	-.15	.12	
Inverse Mills Ratio	0	.01	0.03	.97	-.02	.02	
Mean dependent var		0.508	SD dependent var		0.755		
Number of obs		1215	F-test		108.790		

**** p<.01, ** p<.05, * p<.1*

Countries: 92
Instrument count: 81

Lag limit (years): 3
AB test (AR2) (p-value): 0.853
Hansen test (p-value): 0.278
Difference-in-Hansen test (p-value): 0.865

Model 3

ghes_che	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ghes_che	.83	.09	9.38	0	.65	1	***
L. ln_odaplus_health_pub_gdp	-.45	.27	-1.69	.1	-.97	.08	*
L. ln_odaplus_health_civpriv_gdp	.06	.25	0.22	.82	-.45	.56	
L. ln_odaplus_nonhealth_pub_gdp	-.07	.37	-0.20	.84	-.81	.66	
L. ln_odaplus_nonhealth_civpriv_gdp	-.15	.39	-0.37	.71	-.93	.63	
L. ln_debt_serv_gdp	-.1	.42	-0.23	.82	-.94	.75	
L. ln_debt_stock_gdp	-.98	.86	-1.14	.26	-2.68	.73	
imf_cond_ba1tot	.02	.02	0.96	.34	-.02	.05	
imf_part	-1.42	.74	-1.92	.06	-2.89	.05	*
ln_gdp_cap_c	-.37	1.87	-0.20	.84	-4.08	3.35	
imr	-.05	.06	-0.84	.4	-.17	.07	
gov_eff	.6	1.98	0.30	.76	-3.33	4.53	
corr_control	2.38	2.49	0.96	.34	-2.57	7.33	
battle_dum	.23	.78	0.30	.77	-1.32	1.79	
col_indfrom_uk	.17	1.56	0.11	.92	-2.92	3.26	
col_indfrom_fra	.21	1.05	0.20	.84	-1.88	2.31	
col_indfrom_spa	.54	1.66	0.33	.74	-2.75	3.84	
Inverse Mills Ratio	-.05	.32	-0.16	.87	-.7	.59	
Mean dependent var		42.422	SD dependent var		19.049		
Number of obs		1215	F-test		840.373		

**** p<.01, ** p<.05, * p<.1*

Countries: 92
Instrument count: 77
Lag limit (years): 3
AB test (AR2) (p-value): 0.151
Hansen test (p-value): 0.278
Difference-in-Hansen test (p-value): 0.354

Model 4

ln_ghes_gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
L. ln_ghes_gdp	.83	.06	13.16	0	.7	.95	***
L. ln_odaplus_health_pub_gdp	-.02	.01	-1.82	.07	-.05	0	*
L. ln_odaplus_health_civpriv_gdp	.01	.01	0.66	.51	-.01	.02	
L. ln_odaplus_nonhealth_pub_gdp	.01	.02	0.48	.63	-.03	.04	
L. ln_odaplus_nonhealth_civpriv_gdp	-.01	.02	-0.58	.56	-.05	.03	
L. ln_debt_serv_gdp	0	.02	0.26	.8	-.03	.04	
L. ln_debt_stock_gdp	-.05	.03	-1.54	.13	-.12	.02	
imf_cond_ba1tot	0	0	0.02	.99	0	0	
imf_part	-.01	.03	-0.54	.59	-.07	.04	
ln_gdp_cap_c	-.06	.07	-0.78	.44	-.2	.09	
imr	0	0	-1.00	.32	-.01	0	
gov_eff	.04	.07	0.56	.58	-.1	.18	
corr_control	.08	.06	1.34	.18	-.04	.2	
battle_dum	.04	.03	1.29	.2	-.02	.11	
col_indfrom_uk	-.01	.06	-0.11	.91	-.12	.11	
col_indfrom_fra	-.02	.05	-0.43	.67	-.11	.07	
col_indfrom_spa	.04	.05	0.79	.43	-.05	.13	
Inverse Mills Ratio	-.01	.01	-0.68	.5	-.03	.02	

Mean dependent var	0.638	SD dependent var	0.721
Number of obs	1215	F-test	213.828

*** p<.01, ** p<.05, * p<.1

Countries: 92
Instrument count: 77
Lag limit (years): 3
AB test (AR2) (p-value): 0.271
Hansen test (p-value): 0.426
Difference-in-Hansen test (p-value): 0.312

10.4.5. Metadata for variables in dataset

Variable name	Description	Unit	Type	Original variable name in database	WB opendata code	Original source	URL	Comment
General								
countryname	Country name; Recipient country of development assistance; debtor country.	-	Text	-	-	-	-	
iso3c	3-letter isocode of country	-	Text	Country Code	-	Azevedo, J.P. (2011) "wbopendata: Stata module to access World Bank databases," Statistical Software Components S457234, Boston College Department of Economics. http://ideas.repec.org/c/boc/bocode/s457234.html	https://databank.worldbank.org/data/source/world-development-indicators/preview/on	Obtained with "wbopendata" command in Stata
iso3n	3-digit isocode of country	-	Numerical	-	-	Raciborski, R. (2008). "kountry: A Stata utility for merging cross-country data from multiple sources," The Stata Journal, 8(3), 390-400.	https://databank.worldbank.org/data/source/world-development-indicators/preview/on	Obtained with "kountry" command in STATA
wb_regioncode	3-letter code of World Bank Region	-	Text	region	-	*Reference:* Azevedo, J.P. (2011) "wbopendata: Stata module to access World Bank databases," Statistical Software Components S457234, Boston College Department of Economics. http://ideas.repec.org/c/boc/bocode/s457234.html	https://databank.worldbank.org/data/source/world-development-indicators/preview/on	Obtained with "wbopendata" command in Stata
wb_region	World Bank region name	-	Text	regionname	-	*Reference:* Azevedo, J.P. (2011) "wbopendata: Stata module to access World Bank databases," Statistical Software Components S457234, Boston College Department of Economics. http://ideas.repec.org/c/boc/bocode/s457234.html	https://databank.worldbank.org/data/source/world-development-indicators/preview/on	Obtained with "wbopendata" command in Stata
un_reg_det	United Nations region name (detailed)	-	Text	-	-	Raciborski, R. (2008). "kountry: A Stata utility for merging cross-country data from multiple sources," The Stata Journal, 8(3), 390-400; United Nations Statistics Division, Methodology, Standard country or area codes for statistical use (M49)	https://unstats.un.org/unsd/methodology/m49/	Obtained with "kountry" command in STATA

incomelevel	World Bank income group (abbreviation)	-	Text	incomelevel	-	*Reference:* Azevedo, J.P. (2011) "wbopendata: Stata module to access World Bank databases," Statistical Software Components S457234, Boston College Department of Economics. http://ideas.repec.org/c/boc/bocode/s457234.html	https://databank.worldbank.org/data/source/world-development-indicators/preview/on	Obtained with "wbopendata" command in Stata
incomelevelname	World Bank income group (full name)	-	Text	incomelevelname	-	*Reference:* Azevedo, J.P. (2011) "wbopendata: Stata module to access World Bank databases," Statistical Software Components S457234, Boston College Department of Economics. http://ideas.repec.org/c/boc/bocode/s457234.html	https://databank.worldbank.org/data/source/world-development-indicators/preview/on	Obtained with "wbopendata" command in Stata
lendingtype	World Bank lending group code	-	Text	lendingtype	-	*Reference:* Azevedo, J.P. (2011) "wbopendata: Stata module to access World Bank databases," Statistical Software Components S457234, Boston College Department of Economics. http://ideas.repec.org/c/boc/bocode/s457234.html	https://databank.worldbank.org/data/source/world-development-indicators/preview/on	Obtained with "wbopendata" command in Stata
lendingtypename	World Bank lending group name	-	Text	lendingtypename	-	*Reference:* Azevedo, J.P. (2011) "wbopendata: Stata module to access World Bank databases," Statistical Software Components S457234, Boston College Department of Economics. http://ideas.repec.org/c/boc/bocode/s457234.html	https://databank.worldbank.org/data/source/world-development-indicators/preview/on	Obtained with "wbopendata" command in Stata
year	Calendar year of development assistance disbursed, debt repayment made, health expenditures made, etc.	Number	Integer	-	-	-	-	
Health financing								
ghes_che	"Domestic General Government Health Expenditure (GGHE-D) as % Current Health Expenditure (CHE)"	%	continuous	"Domestic General Government Health Expenditure (GGHE-D) as % Current Health Expenditure (CHE)"	SH.XPD.GHED.CH.ZS	WHO Global Health Expenditure Database	http://apps.who.int/nha/database/Select/Indicators/en	

ghes_cap	"Domestic General Government Health Expenditure (GGHE-D) per Capita in US$"	current US$	continuous	"Domestic General Government Health Expenditure (GGHE-D) per Capita in US$"	SH.XPD.GHED.PC.CD	WHO Global Health Expenditure Database	http://apps.who.int/nha/database/Select/Indicators/en	
ghes_gdp	"Domestic General Government Health Expenditure (GGHE-D) as % Gross Domestic Product (GDP)"	%	continuous	"Domestic General Government Health Expenditure (GGHE-D) as % Gross Domestic Product (GDP)"	SH.XPD.CHEX.GD.ZS	WHO Global Health Expenditure Database	http://apps.who.int/nha/database/Select/Indicators/en	
oop_che	"Out-of-pocket (OOPS) as % of Current Health Expenditure (CHE)"	%	continuous	"Out-of-pocket (OOPS) as % of Current Health Expenditure (CHE)"	SH.XPD.OOPC.CH.ZS	WHO Global Health Expenditure Database	http://apps.who.int/nha/database/Select/Indicators/en	
oop_cap	"Out-of-Pocket Expenditure (OOPS) per Capita in US$"	current US$	continuous	"Out-of-Pocket Expenditure (OOPS) per Capita in US$"	SH.XPD.OOPC.PC.CD	WHO Global Health Expenditure Database	http://apps.who.int/nha/database/Select/Indicators/en	
Development assistance								
odaplus_health	Official Development Assistance (ODA) and Bill and Melinda Gates Foundation (BMGF) funding for health	current US$	continuous	-	-	Organisation for Economic Co-operation and Development (OECD) Creditor Reporting System (CRS)	https://stats.oecd.org/	For sectoral categories 120: "Health, Total" and 130: "Population Policies/Programmes & Reproductive Health, Total" - negative debt relief, administrative expenses and other in-donor country expenses
odaplus_health_pub	Official Development Assistance (ODA) and Bill and Melinda Gates Foundation (BMGF) funding for health channeled via the public sector	current US$	continuous	-	-	Organisation for Economic Co-operation and Development (OECD) Creditor Reporting System (CRS)	https://stats.oecd.org/	For sectoral categories 120: "Health, Total" and 130: "Population Policies/Programmes & Reproductive Health, Total" - negative debt relief, administrative expenses and other in-donor country expenses.
odaplus_health_civpriv	Official Development Assistance (ODA) and Bill and Melinda Gates Foundation (BMGF) funding for health channeled via NGO's & civil socity, and private sector institutions	current US$	continuous	-	-	Organisation for Economic Co-operation and Development (OECD) Creditor Reporting System (CRS)	https://stats.oecd.org/	For sectoral categories 120: "Health, Total" and 130: "Population Policies/Programmes & Reproductive Health, Total" -

								negative debt relief, administrative expenses and other in-donor country expenses.
odaplus_non health	Official Development Assistance (ODA) and Bill and Melinda Gates Foundation (BMGF) funding not for health	current US$	continuous	-	-	Organisation for Economic Co-operation and Development (OECD) Creditor Reporting System (CRS)	https://stats.oecd.org/	For all other categories - negative debt relief, administrative expenses and other in-donor country expenses
odaplus_non health_pub	Official Development Assistance (ODA) and Bill and Melinda Gates Foundation (BMGF) funding not for health channelled via public sector	current US$	continuous	-	-	Organisation for Economic Co-operation and Development (OECD) Creditor Reporting System (CRS)	https://stats.oecd.org/	For all other categories - negative debt relief, administrative expenses and other in-donor country expenses
odaplus_non health_civpriv	Official Development Assistance (ODA) and Bill and Melinda Gates Foundation (BMGF) financial assistance not for health channelled via NGO's & civil society and private sector institutions	current US$	continuous	-	-	Organisation for Economic Co-operation and Development (OECD) Creditor Reporting System (CRS)	https://stats.oecd.org/	For all other categories - negative debt relief, administrative expenses and other in-donor country expenses
Debt								
debt_stock_eppg	"External debt stocks, public and publicly guaranteed (PPG) (DOD, current US$)"	current US$	continuous	"External debt stocks, public and publicly guaranteed (PPG) (DOD, current US$)"	DT.DOD.DPPG.CD	World Bank Databank: International Debt Statistics	https://databank.worldbank.org/source/international-debt-statistics	
debt_serv_eppg	"Debt service on external debt, public and publicly guaranteed (PPG) (TDS, current US$)"	current US$	continuous	"Debt service on external debt, public and publicly guaranteed (PPG) (TDS, current US$)"	DT.TDS.DPPG.CD	World Bank Databank: International Debt Statistics	https://databank.worldbank.org/source/international-debt-statistics	
IMF conditionalities								
imf_cond_ba1tot	"The main burden of adjustment indicator (BA1) measures the total number of conditions applicable in a given policy area for a given year in each country." (Total is for all policy areas combined. Includes both binding and non-binding conditions)	number	integer	Burden of Adjustment Indicator 1	-	IMF Monitor	https://imfmonitor.org/conditionality/	
imf_cond_ba2tot	"An alternative burden of adjustment indicator (BA2) considers only binding conditions. The IMF attaches greater importance to their implementation and requires waivers if they are missed in order for loan disbursement to occur, thereby carrying greater coercive power than non-binding conditions." (Total is for all policy areas combined).	number	integer	Burden of Adjustment Indicator 2	-	IMF Monitor	https://imfmonitor.org/conditionality/	

imf_cond_ba3tot	"Another burden of adjustment indicator (BA3) reflects the greater coercive power of binding conditions while also incorporating non-binding conditions. In this indicator, conditions are assigned a weighting according to the importance that the IMF attaches to their implementation. Binding conditions are assigned a weight of 2, while non-binding conditions are assigned a weight of 1." (Total is for all policy areas combined).	number	integer	Burden of Adjustment Indicator 3	-	IMF Monitor	https://imfmonitor.org/conditionality/
Covariates							
pop	"Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The values shown are midyear estimates."	number	continuous	"Population, total"	SP.POP.TOTL	World Bank Databank: World Development Indicators	https://databank.worldbank.org/data/source/world-development-indicators/preview/on
gdp	"GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used."	current US$	continuous	"GDP (current US$)"	NY.GDP.MKTP.CD	World Bank Databank: World Development Indicators	https://databank.worldbank.org/data/source/world-development-indicators/preview/on
gdp_cap	"GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars."	current US$	continuous	"GDP per capita (current US$)"	NY.GDP.PCAP.CD	World Bank Databank: World Development Indicators	https://databank.worldbank.org/data/source/world-development-indicators/preview/on
mmr_me	"Maternal mortality ratio is the number of women who die from pregnancy-related causes while pregnant or within 42 days of pregnancy termination per 100,000 live births. The data are estimated with a regression model using information on the proportion of maternal deaths among non-AIDS deaths in women ages 15-49, fertility, birth attendants, and GDP measured using purchasing power parities (PPPs)."	# per 100,000 live births	continuous	"Maternal mortality ratio (modelled estimate, per 100,000 live births)"	SH.STA.MMRT	WHO, UNICEF, UNFPA, World Bank Group, and UNDESA/Population Division. Trends in Maternal Mortality 2000 to 2020. Geneva, World Health Organization, 2023	https://www.who.int/publications/i/item/9789240068759
imr	"Infant mortality rate is the number of infants dying before reaching one year of age, per 1,000 live births in a given year."	# per 1000 live births	continuous	Mortality rate, infant (per 1,000 live births)	SP.DYN.IMRT.IN	Estimates developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF,	https://childmortality.org

						WHO, World Bank, UN DESA Population Division)		
u5mr	"Under-five mortality rate is the probability per 1,000 that a newborn baby will die before reaching age five, if subject to age-specific mortality rates of the specified year."	# per 1000 live births	continuous	Mortality rate, under-5 (per 1,000 live births)	SH.DYN. MORT	Estimates developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division)	https://childmortality.org	
gov_eff	"Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5."	Number (standard deviations)	continuous	"Government Effectiveness: Estimate"	GE.EST	Worldwide Governance Indicators (WGI). Source: "Daniel Kaufmann and Aart Kraay (2023). Worldwide Governance Indicators, 2023 Update"	https://www.govindicators.org/	
corr_control	"Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5."	Number (standard deviations)	continuous	"Control of Corruption: Estimate"	CC.EST	Worldwide Governance Indicators (WGI). Source: "Daniel Kaufmann and Aart Kraay (2023). Worldwide Governance Indicators, 2023 Update"	https://www.govindicators.org/	
battledeaths_ orig	"Battle-related deaths are deaths in battle-related conflicts between warring parties in the conflict dyad (two conflict units that are parties to a conflict). Typically, battle-related deaths occur in warfare involving the armed forces of the warring parties. This includes traditional battlefield fighting, guerrilla activities, and all kinds of bombardments of military units, cities, and villages, etc. The targets are usually the military itself and its installations or state institutions and state representatives, but there is often substantial collateral damage in the form of civilians being killed in crossfire, in indiscriminate bombings, etc. All deaths--military as well as civilian--incurred in such situations, are counted as battle-related deaths."	Number	Integer	"Battle-related deaths (number of people)"	VC.BTL.D ETH	Uppsala Conflict Data Program (UCDP) / Peace Research Institute Oslo (PRIO) Battle-Related Deaths Dataset version 23.1: - Davies, Shawn, Therese Pettersson & Magnus Öberg (2023). Organized violence 1989-2022 and the return of conflicts between states?. Journal of Peace Research 60(4).	https://ucdp.uu.se/downloads/	
battledeaths_ imp	battledeaths_orig with 0's imputed for country-years without data, as the Battle-Related Deaths dataset only includes country-years with deaths	Number	Integer	-	-	Uppsala Conflict Data Program (UCDP) / Peace Research Institute Oslo (PRIO) Battle-Related Deaths Dataset version 23.1: - Davies, Shawn, Therese Pettersson & Magnus Öberg (2023). Organized violence 1989-2022 and the return of conflicts between states?.	https://ucdp.uu.se/downloads/	Generated variable

						Journal of Peace Research 60(4).		
battle_dum	1 if number of battle-related deaths is higher than 1 per 1 million population; 0 if less (generated from battledeaths and pop-variables)	Number	Binary	-	-	Uppsala Conflict Data Program (UCDP) / Peace Research Institute Oslo (PRIO) Battle-Related Deaths Dataset version 23.1: - Davies, Shawn, Therese Pettersson & Magnus Öberg (2023). Organized violence 1989-2022 and the return of conflicts between states?. Journal of Peace Research 60(4).	https://ucdp.uu.se/downloads/	Generated variable
col_indfrom	"The COW country code for the state, empire, or other entity from which this state gained independence. This variable is coded as missing where the state did not gain independence from a COW system member (e.g., by unifying local units into a new state)."	Correlates Of War (COW)-country code	Numerical	IndFrom	-	Paul R. Hensel (2018). "ICOW Colonial History Data Set, version 1.1."	http://www.paulhensel.org/icowcol.html	
col_indfrom_uk	Independence was gained from United Kingdom. 1= true, 0= false.	Number	Binary	-		Paul R. Hensel (2018). "ICOW Colonial History Data Set, version 1.1."	http://www.paulhensel.org/icowcol.html	Generated variable
col_indfrom_fra	Independence was gained from France. 1= true, 0= false.	Number	Binary	-		Paul R. Hensel (2018). "ICOW Colonial History Data Set, version 1.1."	http://www.paulhensel.org/icowcol.html	Generated variable
col_indfrom_spa	Independence was gained from Spain. 1= true, 0= false.	Number	Binary	-		Paul R. Hensel (2018). "ICOW Colonial History Data Set, version 1.1."	http://www.paulhensel.org/icowcol.html	Generated variable
cpi	"Consumer price index reflects changes in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used. Data are period averages." 2010 = 100	Number	Continuous	"Consumer price index (2010 = 100)"	FP.CPI.TOTL	International Monetary Fund (IMF)	https://data.imf.org/?sk=4ffb52b2-3653-409a-b471-d47b46d904b5	
cpi_us_2020	Same as above with base-year recalculated to 2020.	Number	Continuous	"Consumer price index" (2020 = 100)	-	International Monetary Fund (IMF)	https://data.imf.org/?sk=4ffb52b2-3653-409a-b471-d47b46d904b5	Generated variable
gdpdefl_us_2020	"The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency. The base year varies by country." 2020 = 100	Number	Continuous	GDP deflator	NY.GDP.DEFL.ZS	World Bank	https://databank.worldbank.org/metadataglossary/world-development-indicators/series/NY.GDP.DEFL.ZS	Generated variable (recalculated from base year 2015)
cur_acc_bal_gdp	"Current account balance is the sum of net exports of goods and services, net primary income, and net secondary income."	%	continuous	Current account balance (% of GDP)	BN.CAB.XOKA.GD.ZS	International Monetary Fund, Balance of Payments Statistics Yearbook and data files, and	https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-	

						World Bank and OECD GDP estimates.	52b0c1a0179b&sid=1390030341854 https://data.worldbank.org/indicator/BN.CAB.XOKA.GD.ZS
res_imp	"Total reserves comprise holdings of monetary gold, special drawing rights, reserves of IMF members held by the IMF, and holdings of foreign exchange under the control of monetary authorities. The gold component of these reserves is valued at year-end (December 31) London prices. This item shows reserves expressed in terms of the number of months of imports of goods and services they could pay for [Reserves/(Imports/12)]."	months	continuous	Total reserves in months of imports	FI.RES.TOTL.MO	International Monetary Fund, International Financial Statistics and data files.	https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b&sid=1390030341854 https://data.worldbank.org/indicator/FI.RES.TOTL.MO
excrate	"Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar)."	Local currency units per US$	continuous	Official exchange rate (LCU per US$, period average)	PA.NUS.FCRF	International Monetary Fund, International Financial Statistics.	https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b&sid=1390030341854 https://data.worldbank.org/indicator/FI.RES.TOTL.MO
gdp_growth	"Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2015 prices, expressed in U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources."	%	Continuous	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	World Bank national accounts data.	https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG
voice_acc	"Voice and Accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5."	Number (standard deviations)	Continuous	Voice and Accountability: Estimate	VA.EST	Worldwide Governance Indicators (WGI). Source: "Daniel Kaufmann and Aart Kraay (2023). Worldwide Governance Indicators, 2023 Update"	https://www.govindicators.org/

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10.5. Appendix 5: Interview supplementary materials

10.5.1. Participant information sheet

PARTICIPANT INFORMATION SHEET

Study title: ***Official Development Assistance, External Public Debt and Equity in Domestic Health Financing in Low- and Middle-Income Countries: Panel Data Analysis and Case Study in Senegal***

Primary funder: Economic & Social Research Council (ESRC)

Principal Investigator (PI) : Dr Frederik Federspiel, MD, MPH, PhD Candidate, Dept. Of Global Health and Development, Faculty of Public Health and Policy, London School of Hygiene and Tropical Medicine.

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Co-PI: Elhadji Mamadou Mbaye, PhD, Responsable Unité Sciences Sociales et Santé - Institut de Recherche en Santé, de Surveillance Epidémiologique et de Formation (IRESSEF)

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Background and aims
The composition of domestic financing for health in Senegal is shaped by a broader political and economic context. This research aims to study the role of international donors and creditors in determining this financing in Senegal. We intend to publish the results of this research.

Methods
This case study of Senegal consists of interviews with representatives and document reviews at ministries and health policy institutions at the regional and district level, international official donor and creditor institutions, academics and health professionals, and civil society organizations in Senegal.

Participation
You have been invited to participate in this study because we believe you may be knowledgeable about some of the dynamics between international donors and creditors and the Senegalese health sector. By participating and sharing your knowledge, you will be able to contribute to our understanding of this topic. By participating in this study, you will not be putting yourself or anyone else at any risk. Participation is completely voluntary. If you agree to participate, you may still withdraw at any time without giving a reason. The interviewer will take notes during the interview. We would like to record the interview and transcribe the interview for our analysis, however, you may ask for the interview not to be recorded. In that case, the interviewer will only take hand-written notes without recording during the interview.

Confidentiality
You have the option of being anonymous or to have your identity reported in the publications we will write from the research. If you choose to be anonymous, you may choose from different levels of anonymity: You can choose to only have your name anonymized, to also have your position in the organization you work in anonymized, and to have the organization you work in anonymized as well. You can further ask that we don't quote you at all, not even anonymously, and in that case we will only use the information you provide us to inform our analyses but with no direct citation or reference. Frederik Federspiel (the principal investigator) and a transcriptionist will be the only persons who will have access to the recordings produced from the interview. The transcriptionist will be bound by a confidentiality agreement that will make her/him unable to disclose any information about you to third parties. All raw interview recordings will be destroyed at the end of the project.

Please consider whether you would like to remain anonymous, and if so the degree of anonymity you would prefer.

You will also have the opportunity to decide whether the transcripts themselves, i.e. your words on paper, can be made publicly available in anonymized form in our secure online data repository at the end of the project. If you accept this, we will anonymize the transcript according to your choice in the participant consent form.

Any questions you may have will be answered during the interview. If you have any questions in the meantime, please feel free to contact Frederik using the information below.

Further information
If you have any questions, please contact:

Frederik Federspiel
Unité sciences sociales et santé
Institut de Recherche en Santé, de Surveillance Epidémiologique et de Formation, IRESSEF
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10.5.2. Ethical consent form

ETHICAL CONSENT FORM

Study title: ***Official Development Assistance, External Public Debt and Equity in Domestic Health Financing in Low- and Middle-Income Countries: Panel Data Analysis and Case Study in Senegal***

Primary funder: Economic & Social Research Council (ESRC)

Principal Investigator (PI): Dr Frederik Federspiel, MD, MPH, PhD Candidate, Dept. Of Global Health and Development, Faculty of Public Health and Policy, London School of Hygiene and Tropical Medicine.

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Phone: 76 497 72 11 Email: elhadjimamadou.mbaye@iressef.org

Participant identification number: |__|__|__|__|__|__|__|__|__|__|__|__|

_____ (Participant name)

1. a. ☐ I have read the information sheet for this study and understood the information provided

OR

1. b. ☐ The study personnel have informed me in a language I understand

AND I

- confirm that my choice to participate is entirely voluntary,
- understand that I may withdraw from this study at any time without giving a reason,
- confirm that I have had the opportunity to ask questions about this study and that I am satisfied with the answers provided,
- understand that I authorize the persons described in the information sheet to access the interview recording and transcript (in the case that I authorize recording of the interview),
- have had time to think about whether I would like to participate in this study,
- agree to participate in this study.

2. ☐ I agree that this interview can be recorded.

3. Please read the following options carefully and tick **ONE**:

a. ☐ I agree that the contents of this interview can be quoted and that these quotations can be attributed to me

b. ☐ I agree that the contents of this interview can be quoted, but I would like my name to be anonymized, although you can mention my organization and my position within it

c. ☐ I agree that the contents of this interview can be quoted, but I would like my name and my position within my organization to be anonymized, although you can mention my organization

d. ☐ I agree that the contents of this interview can be quoted, but I would like my name, position and organization to be anonymized. However, you may refer to me as "a representative of Ministry X", "a representative of a donor agency", "a representative of a creditor agency" or "a representative of an NGO", as the case may be

(if other, please indicate: ……)

e. ☐ I agree that the contents of this interview can be quoted, but I would like my name to be anonymized, as well as any information that can be used to identify me, including my organization and my position within it

f. ☐ I do not agree that the contents of my interview can be quoted, but the researchers can use the information from my interview to inform their analyses

4. Do you allow the transcript of your interview to be made available in a secure online data repository? If so, we will follow the level of anonymity you have selected above, for example, if you have selected option "c" above, we will delete any information that allows others to identify your name and your position within your organization.

a. ☐ Yes
b. ☐ No

Full name: ……..…

Date (dd/mm/yy): ……..…… Time (24h) :…….

Signature: ……..…….

To be completed by the person obtaining the consent:

Name of person obtaining consent:
.....

I confirm that I have explained the study information accurately in ..... and that the participant has understood it to the best of my knowledge.
He/she has freely consented to participate.

Name: ……...……..…

Date (dd/mm/yy): ……..……. *Time (24h) :*……..

Signature: ……..…….

10.5.3. Example interview topic guide

Example interview guide for donors in Senegal

Study title: ***Official Development Assistance, External Public Debt and Equity in Domestic Health Financing in Low- and Middle-Income Countries: Panel Data Analysis and Case Study in Senegal***

General information
Country of origin:
Place of residence:

1. Icebreaker
    a. What is your role in this institution?
    b. How long have you been working here?
    c. Have you held any other positions here? (Which ones?)
2. Health sector financing
    a. What are the priority areas of [NAME OF ORGANISATION] for your support to the health sector in Senegal? (Why do you give priority to these areas?)
    b. In regard to the topic of health financing, or more broadly health economics, does [NAME OF ORGANISATION] have any specific projects/ programs in this area in Senegal? (Can you tell me about this?)
    c. What about universal health coverage and access to health services? Do you have any programs in this area? (Can you tell me about this?)
    d. Why has [NAME OF ORGANISATION] chosen to support the programs you just mentioned? (What are their qualities of these programs) ?
    e. How does [NAME OF ORGANISATION] want the balance between public and private health financing in Senegal to develop over time: Towards higher dependence on private or public funding? Why?
    f. Who does [NAME OF ORGANISATION] think should contribute the majority of health funding in Senegal? (Government, donors, patients)? Why ?
3. Involvement of international stakeholders in determining the public health budget
    a. In your opinion, does the [NAME OF ORGANISATION] have a say when the overall size and distribution between the different expenditure items are decided for the health budget in Senegal? (Please explain)
    b. In your opinion, which stakeholders outside of the government have the most influence on these decisions? (Donors, creditors, civil society, voters)? (Why do you think so)?
    c. Under your impression, what are their main priorities or objectives in these processes?

d. Do you see any conflicting priorities between these international actors' and the government's priorities with regard to Senegal's health budget? (Which ones?)

e. Do you see any mutually contradictory priorities between the different international actors, including yours, with regard to the health budget? (Which ones?)

4. Fungibility

a. Does the [NAME OF ORGANISATION] have an opinion on how national resources for a sector should be spent when development assistance for that sector is received, i.e. should the government increase its funding, keep at same level, or lower it? Can you tell me about this?

b. Have you ever seen a decrease in domestic government funding for the health sector after having received development assistance for this sector? Can you tell me about this ?

i. *If yes:* How has this affected the health sector?

ii. *If yes*: What happens when the aid is exhausted? Do you normally see domestic funding increased back to the initial level so that health services can continue?

iii. *If yes*: Do you think that this reduction in domestic funding, when development assistance is received, affects access to health services? If so, how? (For the poor, in rural areas?)

c. *(If applicable): The effects you mention, when have they mainly occurred?*

Are they still happening today?

In your experience, does the [NAME OF ORGANISATION] have an influence on how the Senegalese government spends its own money when you provide development assistance for a sector? In what ways?

d. *(If applicable) : What is your opinion on this redistribution of funds? Why ?*

5. Loans and debt repayments

a. In your experience, which sectors have development loans received from international financial institutions (International Monetary Fund (IMF), World Bank, African Development Bank) and bilateral creditors mainly benefited?

b. In your experience, have the development loans received from these agents benefited the health sector? (In what way?)

c. Do you think that the debt owed to external official creditors and the repayments made on this debt affect the Senegalese health budget?

i. *If yes*: In what ways?

ii. *If yes*: Do you think it affects the health sector more than other sectors? Why/ why not?

iii. *If yes*: And how do you think this may affect access to health services? (For the poor, in rural areas?)

iv. *If yes*: Do you think this is a growing, stable or diminishing problem? Why?

6. <u>IMF / World Bank Programs and loan conditionalities</u>
    a. Today, Senegal is part of IMF and World Bank programmes and is subject to the policy conditionalities necessary to be able to lend from these institutions. Do you think that these programmes with their conditionalities have affected Senegal's health sector?
        i. If yes: In what ways?
        ii. If yes: Do you think these conditionalities have affected access to health services? (In what ways?) (For the poor, in rural areas?)
    b. Are you aware of any conditionalities imposed by IMF/WB programs directly on the health sector?
        i. If yes: How do you think these conditionalities have affected the health sector?
        ii. If yes: Do you think these conditionalities have affected access to health services? (How?) (For the poor, in rural areas?)
    c. Some countries have experienced national wage ceilings [*explain*] for the health sector as part of these programs. Do you know if this has been the case for Senegal? (Can you tell me about them?)
    d. What about the privatization of health facilities due to loan conditionalities from the IMF/WB? (Can you tell me about this?)
    e. What about the introduction of user fees for health services? (Can you tell me about this ?)
        i. (*If applicable*): How do you think these things have affected access to health services in Senegal? (For the poor, in rural areas?)
        ii. (*If applicable*): The effects you mention, when have they mainly occurred?
            i. Are they still happening today?

6. <u>Last question</u>
    a. Is there anyone else you would recommend I interview ?

Thank you

10.5.4. Interview analysis codebook

Name	Description
Access	Access to health services.
Balance public vs. private	The balance between public and private health services.
Coordination, alignment or conflict (priorities & activities)	Statements about coordination, alignment or conflict between stakeholders, both in terms of their different stated priorities and their actual activities. (This category pertains to all stakeholders).
Creditor financing	Statements about what or with how much money a creditor finances.
Debt	Anything pertaining to debt.
Debt constraining health financing	Debt having - or not having - a constraining effect on domestic health financing.
Debt sustainability	The sustainability of public debt.
Debt, general	Statements about debt that are not captured by the other sub-categories.
Domestic health financing	Financing of health services with internally derived funds, i.e. no external assistance.
Domestic health financing, other	Statements about domestic health financing that do not fit into any of the other categories
Government health financing (schemes)	Financing for health services from the government. When specific schemes are mentioned, these are coded under the sub-nodes.
Couverture Maladie Universelle (CMU)	Specific government health financing schemes providing free care for the following groups: - People over 60 (Plan Sesame) - Children under 5 - School children - Free cesarian sections and dialysis
Govt. health fin. schemes, other	Other government health financing schemes not captured under the above themes
Mutuelles	Specific node for the “Mutuelles”, a government-subsidised community health insurance scheme. This also falls under the “Couverture Maladie Universelle (CMU)” but is separately coded due to its significance.
Out-of-pocket payments (OOP), user fees	Out-of-Pocket Payments (OOPs), user fees or other terms for direct contributions to the health system from the patient/caregiver/household at the point of care.
Private health insurance	Private Health Insurance (PHI) schemes, Voluntary Health Care Payment Schemes (VHPS) or other terms for private health care payment schemes without relation to government schemes.
Private sector	Private sector participation in the health sector, both in terms of supply of services (e.g. private clinics) and financial contributions to the health sector (e.g. through taxation or donations).
Donor financing	Statements about what or with how much money a donor finances.
Efficiency, effectiveness	Statements about efficiency or effectiveness, e.g. administrative efficiency, cost-effectiveness, etc.
Equity	
Equity in allocation (access)	Equity in allocation of resources. Statements relating to issues of equity in access to health services are also included under this node, as these often relate to issues of allocative equity.

Name	Description
Equity in contributions	Equity in terms of “who contributes” financially to health services.
Equity, general	Statements about equity that are not captured by the other sub-categories.
Gender equity	Gender equity
Geographical equity	Statements relating to equity between regions, urban vs. rural or other geographical delineations.
Fungibility	Fungibility
Governance, management, administration	Governance, management or administration
Inadequate health financing	Statements that health financing is inadequate or should increase.
Inadequate, domestic	Inadequate domestic health financing
Inadequate, external	Inadequate external health financing
Inadequate, unspecified	Inadequate health financing, specific source unspecified
Inclusion, transparency	Inclusion by any stakeholder of other stakeholders in policy or decision-making processes. Transparency of processes in stakeholder organisations.
Influence	The influence of stakeholders on other stakeholders, primarily on the government. (Aggregate)
Academic influence	Academic influence on any stakeholder group or any domestic affairs.
Creditor influence	Creditor influence on domestic affairs.
CSO influence	CSO influence on any stakeholder group or any domestic affairs.
Donor influence	Donor influence on domestic affairs.
Government influence	Government influence on any non-governmental stakeholder group or influence by one ministry/department on another.
Health System Agent influence	HSA influence on any stakeholder group or any domestic affairs.
Influence, other	Influence by other stakeholder
Loan & creditor policy conditionalities	Anything on loan and creditor policy conditionalities. Includes policy requirements in lending and fiscal policy programs, e.g. budget prescriptions (e.g. sectoral budget floors), wage ceilings, decentralisation / privatisation requirements, etc.
National sovereignty, autonomy, ownership	Statements relating to notions of national sovereignty, autonomy or policy ownership (for Senegal).
Official Development Assistance	Anything pertaining to Official Development Assistance (ODA), including Development Assistance for Health (DAH).
Development Assistance for Health	Anything pertaining to Development Assistance for Health (DAH) (both loans and grants).
Development Assistance for Health, general	Statements about Development Assistance for Health (DAH) that are not captured by the other sub-categories.
Grants for health	Development assistance grants for health.
Loans for health	Development assistance loans for the health sector.
Loans vs. grants	Statements mentioning both development assistance

Name	Description
	loans and grants. This can be for the health sector or not (or not specified).
ODA, general	Statements about ODA that are not captured by the other sub-categories.
Other	Category for relevant statements that do not fit into any other categories.
Politically motivated allocation of funds	Statements about funds being allocated due to political motives.
Priorities, attitudes, values	Statements that explicitly describe stakeholder priorities, attitudes or values, i.e. what they “care” about (not just implicitly).
Creditor priorities, attitudes, values	Statements that explicitly describe creditor priorities, attitudes or values (not just implicitly).
Donor priorities, attitudes or values	Statements that explicitly describe donor priorities, attitudes or values (not just implicitly).
Government priorities, attitudes or values	Statements that explicitly describe government priorities, attitudes or values (not just implicitly).
Priorities, attitudes or values (other stakeholder)	Priorities, attitudes or values of other stakeholder
Specific subject areas	
Communicable diseases	Communicable diseases
HRH	Human Resources for Health (HRH)
HSS	Health System Strengthening (HSS).
NCDs	Non-Communicable Diseases (NCDs)
PPPs	Public-Private Partnerships (PPPs)
SRMNCAH	Sexual, Reproductive, Maternal, Neonatal, Child and Adolescent Health (SRMNCAH)
UHC	Universal Health Coverage
Technical support	Statements about technical support.

10.6. Appendix 6: Abbreviations and detailed results table for Chapter 8

Abbreviation	Full name	Explanation
PPG	Public and Publicly Guaranteed	Public and publicly guaranteed external debt comprises external debt obligations of public debtors, which includes the national government, publicly owned corporations and enterprises, development banks, autonomous public bodies and the like, as well as external debt obligations of private bodies that are guaranteed by a public entity (1).
SAP	Structural Adjustment Program	A set of economic reforms that a country had to implement to be eligible to borrow from the IMF/WB in the 1980's-1990's (2).
ESAF	Enhanced Structural Adjustment Facility	IMF facility established in 1987 that provides loans "*on concessional terms*" to LICs facing protracted balance of payments problems. This was changed to the PRGF in 1999 (3).
PRGF	Poverty Reduction and Growth Facility	IMF loan facility, established in 1999 as an extension of ESAF. Loans provided to address balance of payments problems and promote growth for "higher living standards and a reduction in poverty" (3).
PRSP	Poverty Reduction Strategy Paper	National 3-year strategy paper prepared by borrower countries, involving stakeholders including IMF/WB, describing macroeconomic, structural and social policies and programs to "*promote broad-based growth and reduce poverty*" (4).
PSI	Policy Support Instrument	IMF tool for providing economic advice without a borrowing arrangement (5).
ESF	Exogenous Shock Facility	IMF facility that provides financing "*at more appropriate terms*" to LICs facing sudden, exogenous shocks, without an existing PRGF (6).
PCI	Policy Coordination Instrument	Non-financial IMF tool that enables dialogue, monitoring and endorsement by the IMF, allowing countries to "*signal commitment to reforms and catalyze financing from other sources*" (7).
RCF	Rapid Credit Facility	IMF facility that provides "*rapid concessional financial assistance with limited conditionality to low-income countries (LICs) facing an urgent balance of payments need*" (8).
RFI	Rapid Financing Instrument	IMF instrument that "*provides rapid financial assistance, which is available to all member countries facing an urgent balance of payments need*" (9).
SBA	Stand-By Arrangement	IMF decision assuring a country that it will be able borrow a given amount during a given period, contingent upon observing the terms in the supporting arrangement (3).
SCF	Standby Credit Facility	IMF facility that "*provides financial assistance to low-income countries (LICs) with short-term balance of payments needs*" (10).
ECF	Extended Credit Facility	IMF facility that "*provides medium-term financial assistance to low-income countries (LICs) with protracted balance of payments problems*" under the Poverty Reduction and Growth Trust (PRGT) (11).
EFF	Extended Fund Facility	IMF facility that "*provides financial assistance to countries facing serious medium-term balance of payments problems because of structural weaknesses that require time to address"* (12).
RSF	Resilience and Sustainability Facility	IMF facility that "*provides affordable long-term financing to countries undertaking reforms to reduce risks to prospective balance of payments stability, including those related to climate change and pandemic preparedness"* (13).
SDR	Special Drawing Rights	The currency or financial unit used by the IMF, originally equivalent to one US dollar, but closer to 1.4-1.5 US dollars in the past two decades (3, 14).

Table 10.3: Explanation of IMF/WB terms and abbreviations used in this paper.

Time period	Organisation	Instrument/ Arrangement/ Paper	Loans disbursed (SDR if not otherwise specified)*	Loan duration	Loan purpose	Main policy content	Policies, targets and objectives (health financing sources)	Binding loan conditionalities (health financing sources)	Non-binding loan conditionalities (health financing sources)
2023 (15)	WB	Second Equitable and Resilient Recovery in Senegal Development Policy Financing (15)	€276 million (15)	30 years	Support development programme =>	Increase resilience and productivity of households; strengthen productive resources and management of fiscal accounts	Improve access to health services for poorest and strengthen financial soundness of UHC (15)	-	-
2023-(16)	IMF	Extended Fund Facility (EFF); Extended Credit Facility (ECF) and Resilience and Sustainability Facility (RSF) (16, 17)	372 million (17, 18)	3 years	ECF/EFF: Address balance of payment needs. RSF: Address challenges related to climate change and implementation of climate policies. (16).	Fiscal consolidation; stabilize wage bill; cuts in current spending; tax reform; increase domestic revenue mobilisation; cut fuel subsidies; improved public financial management; limit new borrowing; enhance debt management; strengthen fiscal governance; climate change adaptation and mitigation; expand social protection; enhance private sector role in wealth and job creation; diminish gender-based disparities; improve social welfare system (16, 17).	-	-	IT: Social spending floor: 40% of total government spending (16, 17).
2020-24 (19)	WB	Country Partnership Framework	Strategy paper	-	-	Build human capital; boost competitiveness and job creation through private sector-led growth; increase resilience and sustainability in context of growing risks; digitalisation; modernisation; gender equity; climate change effect mitigation; contain fiscal vulnerabilities; high inclusive growth; contain fiscal deficit to 3% of GDP; strengthen revenue mobilisation; increase capital investments; energy sector subsidy reform; improved data on living conditions; reduce poverty; oil and gas revenue management; improvements to WB collaboration and projects. Several sector- and SDG-specific goals (19).	Improve progressiveness of social protection programs including Universal Health Coverage (*Couverture Maladie Universelle,* CMU) (19).	-	-
PCI: 2020-2023	IMF	Policy Coordination Instrument	PCI: Non-financing instrument.	*Details not identified*	Support the overall fiscal and macroeconomic	Temporarily increased fiscal deficit during Covid-19 response then return to 3% of GDP; sale of government buildings; investment cuts; limit debt stock; transient	Increased health spending for Covid response in 2021; increased wage bill for health	-	IT: Social spending floor: 40% of total

(16, 20, 21); SBA and SBCF 2021 (18, 22)		(PCI); Stand-By Arrangement (SBA); Stand-By Credit Facility (SBCF)	SBA: 388 million. SBCF: 194 million (18)	*in document (s)*	country programme (20-25)	energy subsidies to be phased out; adjust energy prices; improve revenue management; including new gas and oil management framework; food subsidies and lower food taxes; strengthen domestic revenue mobilization; new import levy; strengthened debt management; limit new public borrowing; improved spending efficiency; higher education sector investment; promote private-sector led growth and job creation; expand social protection (20-25).	staff; strengthen UHC program (20-26).		government spending (increased from 35% in 2022) (e.g. (23)).
2021 (27)	WB	Additional Financing for the Senegal COVID-19 Response Project	Loan: 57 million. Grant: 47 million (27)	38 years	Emergency health system and social response to Covid-19	Supporting emergency Covid-19 response; Community Engagement and Risk Communication; Project Management and Monitoring and Evaluation	-	-	-
2020 (28)	WB	Investing in Maternal, Child, and Adolescent Health Project (28)	€123 million (28)	37 years	Improve utilization of essential reproductive, maternal, neonatal, child and adolescent health and nutrition (RMNCAH-N) services (28)	Improving availability of RMNCAH-N services of adequate quality; promoting adolescent health and women's empowerment; supporting reforms to strengthen governance, equity, and financing sustainability in the health sector; contingency emergency response	Expand coverage of universal health insurance; CBHI grants for poor and vulnerable; expand maternal health vouchers (28)	-	-
2020 (29)	WB	Third Multi-Sectoral Structural Reforms Development Policy Operation: Supplemental Financing	Loan: €46 million (Grant: SDR 36.6 million)	38 years	Development programme support	*Details not identified in document(s)*	-	-	-
2020 (18, 30)	IMF	Rapid Credit Facility (RCF); Rapid Financing Instrument (RFI)	RCF: 108 million; RFI: 216 million (18)	*Details not identified in document (s)*	Address urgent balance of payment needs due to Covid-19 (30)	Temporarily increased fiscal deficit during Covid-19 response then return to 3% of GDP; support vulnerable households and firms; increase liquidity to banks to ensure credit supply (30).	Increased health spending for Covid-19 response; expand social protection to one million vulnerable households (30).	-	-
2015-2019 (21, 31)	IMF	Policy Support Instrument (PSI)-III	Non-financing instrument	-	-	Increased domestic revenue mobilization via tax reform; simplify tax administration; more equitable tax collection; create fiscal space; closure/merger of government agencies; strengthen public financial management; target	Freeze public sector hiring except for (*other groups and*) frontline health workers (e.g. (31))	-	IT: Social spending floor: 35% of total government

						fiscal deficit of 3% of GDP and contain current expenditure; contain wage bill; enhance efficiency of investment; fiscal consolidation; sustain growth; ensure debt sustainability; strengthen debt management; facilitate private investment and competitiveness; invest in human capital and infrastructure; attract foreign direct investment; tackle rent seeking; develop fiscal framework for oil and gas revenue; facilitate small- and medium-sized enterprise access to credit; improve business environment; address gender and inequality issues; reduce energy subsidies; promote financial sector development and stability (31-38).			spending (e.g. (32))
2017 (39)	WB	First, second and third governance and growth support credits	SDR 91.4 million	*Details not identified in document (s)*	Support government reforms =>	Improving economic governance; increasing public sector performance; promoting growth through private sector development.	Facilitate girls' and women's access to health services; save resources for better financing of primary health clinics	-	-
2013-17 (40, 41)	IMF, WB	Poverty Reduction Strategy Paper (PRSP)-III (*National Strategy for Economic and Social Development, NSESD*)	Strategy paper	-	-	High growth rate; develop production sectors; contain inflation; grow revenue; improve business climate; facilitate access to finance; stabilise public finance; reduce poverty and hunger; control public spending; strengthen exports and foreign direct investment; reduce public deficit; stabilize debt levels; labour market reform; create jobs; numerous sectoral aims; reinforce social protection; promote human rights; justice; gender equity and equality; decentralize government agencies; improve public financial management and efficiency (40, 41).	Numerous aims for health sector including establishing UHC; including through mutual health organizations; extend free healthcare to vulnerable groups; set up health solidarity fund; technical health structure upgrades; target 95% health budget execution; increase the health mutual scheme coverage rate to 66% by 2017 (40, 41).	-	-
2013-17 (42)	WB	Country Partnership Framework	Strategy paper	-	-	Strengthen public governance, accountability and performance; enhance economic resilience; accelerate inclusive growth and create employment; improve service delivery, particularly regarding governance, access and equity in social sectors; energy sector reform; improve education and close skill gap; gender equity; several sectoral goals; improve targeting of social protection programs (42).	-	-	-
2010-15 (43-45)	IMF	Policy Support Instrument (PSI)-II	Non-financing instrument	-	-	Target fiscal deficit of 3% of GDP (about 5-7% in earlier years); invest in human capital and infrastructure; attract foreign direct investment; issue Eurobonds; boost inclusive growth; inclusiveness and poverty reduction; improve business climate; improve access to credit for small- and medium-sized enterprises; improved public financial management; increased public expenditure efficiency; strengthen and improve efficiency of social safety nets; limit	Increase fiscal space for social spending; Front-line health workers exempt from wage bill freeze; decrease current expenditure to allow for progress towards universal health coverage; rationalization of health	-	IT: Social spending floor: 35% of total government spending (e.g. (45))

						public debt; closure/merger of government ministries and agencies; reduce energy subsidies; restructuring of SENELEC (national electricity company); export diversification; job creation; labour market reform including easier layoffs with support for job search and skill training; tax reform; increase revenue; freeze public consumption / decrease current expenditure; freeze wage bill; improve fiscal transparency (43, 45-51).	expenditures with support from WB (43, 45-51).		
2014 (52)	WB	Health and Nutrition Financing Project (52)	Grant: 3 million Loan: 10 million (52)	40 years	Health and nutrition project =>	Results-based financing for health and nutrition services and capacity building; improvement of accessibility to maternal nutrition and child health services; institutional strengthening and project implementation (52)	Establish and implement a universal health insurance system and an equity fund (52)	-	-
2011 (53, 54)	WB	Fifth Poverty Reduction Support Credit (PRSC) (53)	SDR 26.5 million (55)	40 years	Public financial management, (40%), education (10%), health, (20%), infrastructure (20%), environment (10%), and statistics (10%) (54)	Strengthen government policy making and institutional capabilities towards: Improving environment for private investment; private sector development; improving access to basic services; improve efficiency of public expenditure on human capital formation; human resource management in education sector; public hospital performance contracts; nutrition reinforcement; mitigate social and environmental vulnerabilities; improved public financial management, procurement, debt management and statistical systems reforms (53-55).	To increase the population covered by health mutuals (54). Target: 50 mutual schemes over baseline by 2011, 50 more in 2012 (54). Increase share of national budget in financing of new vaccines (40% by 2020) (54).	-	Trigger: Implement state financial support mechanism for health mutuals. Trigger: Support at least 50 new health mutuals covering rural populations and informal workers. Trigger: Ensure adequate budget appropriations for vaccines and related consumables (54).
2010 (56)	WB	Fourth Poverty Reduction Support Credit (PRSC)	SDR 28.4 million (56, 57)	40 years	Public financial management, including budget management, procurement, and debt management (20%), education (20%), health, (20%), social protection	Support implementation of PRSP-II (see below), including wealth creation and private sector development; human development and provision of basic social services, improving recruitment system for teachers; protecting vulnerable groups; improving good governance and participation (56, 57).	To increase the population covered by health mutuals (56). Target: 50 mutual schemes over baseline by 2011 (56).	PA: Initiate preparation of state financial support mechanism for health mutuals. PA: Adoption of the National Strategy for Extending	Trigger: Implement PA (left cell) Trigger: Support at least 50 new health mutuals covering rural populations

					(15%), environment (15%), statistics (5%), and business environment (5%) (56)			Health Risk Coverage.	and informal workers (56).
2008-2010 (58-60)	IMF	Exogenous Shock Facility (ESF)	121 million (18, 60)	*Details not identified in document (s)*	To cope with repercussions of global financial crisis, including balance of payments issues	Allow Senegal to continue program under the PSI (below); settle payment delays; infrastructure investment; temporary easing of fiscal deficit to 4.5% of GDP; Reform public financial management and tax administration; energy sector reform; improving ease of "doing business"; increase monitoring of financial sector (59)	Finance priority social sectors	-	-
2007-10 (61, 62)	IMF	Policy Support Instrument (PSI)-I	Non-financing instrument	-	-	High growth rate; reduce poverty; improve debt management, preserve debt sustainability; increase government revenue; stabilize the wage bill; invest in infrastructure; improve public financial management / fiscal governance; tax reform; improve tax administration; support private sector development; improve business climate; reduce financial sector vulnerabilities; improve financial sector oversight and their contribution to growth; energy sector reform; reform of SENELEC (national electricity company); reduce fiscal deficit to 4% of GDP; settle payment delays with private sector; reduce current expenditure including cutting untargeted subsidies in 2008, then countercyclical fiscal stimulus in 2009/10 (44, 62-66).	Protect social spending and progress toward Millennium Development Goals (MDGs), planned government investments in health were "welcomed" by IMF staff; prioritize health, education, environment and judicial sectors (44, 62-66).	-	IT: Social spending floor: 35% of total government spending from 2010 (e.g. (44))
2007-10 (67)	WB	Country Assistance Strategy	Strategy paper	-	-	Improve transparency and efficiency of public resources; improve public sector accountability and governance; strengthen and modernize the judicial system; enhance private sector development and governance. Wealth creation; infrastructure investment; credit access for small and medium enterprises; develop labour and technology. A number of sectoral goals. Human development/shared growth for poor and vulnerable groups, improved equity, including gender equity; labour market reform and improved productivity; protection of vulnerable groups; prudent fiscal policy; expenditure efficiency; civil service reforms (67).	Improved access for vulnerable groups to health insurance schemes (under the PRSP) (67).	-	-
2008 (68)	WB	Completion report for PRSC I, II and III	Completion report	*see below*	*see below*	Strengthening budgetary and financial procedures; decentralization process; health services: improved financial and human resources management; wealth creation; Improving living conditions (68).	increase access to risk management instruments and social protection measures (outputs/outcomes were pilots to extend health insurance, and introduction of exemption scheme for elderly)	*see below*	*see below*

2007 (69)	WB	Third Poverty Reduction Support Credit (PRSC)	SDR 13.5 million (69, 70)	40 years	Support poverty reduction strategy (69)	Strengthening budgetary and financial procedures; decentralization; Health services, including performance contracts: financial and human resources management; wealth creation; national social protection strategy, fighting child labour (69, 70).	Increase state subsidy of essential drugs and services, government enforced stronger controls on drug tariffs, notably in remote regions (69)	-	IT: Extend pilot program to provide health insurance to uninsured workers in transport and agricultural sectors (69).
2006 (71)	IMF	Article IV consultation	Consultation conducted outside of an existing instrument	-	-	Resolve energy sector problems; prudent fiscal policy; improve fiscal governance and transparency; encourage private sector activity; banking reforms; increase growth; Reduce fiscal deficit to 4% of GDP; phase out subsidies; contain wage bill; eliminate private sector arrears; effective debt management; strengthen tax administration; privatize SENELEC; raise financial sector contribution to the economy; export diversification; improve infrastructure; further trade openness (71)	-	-	-
2006-10 (44, 72)	IMF, WB	Poverty Reduction Strategy Paper (PRSP)-II	Strategy paper	-	-	Main pillars: Wealth creation for pro-poor growth; access to basic social services; improve living conditions of vulnerable groups; social protection; risk and disaster prevention and management; good governance; decentralised participatory development. Also included: Generate fiscal surplus over time; promote private sector participation; preserve debt sustainability; limit fiscal deficit to 4% of GDP; keep wage bill below 30% of tax revenue; strengthen public financial management; decentralize decision-making; improve public investment efficiency; eliminate arrears to private sector (72-75).	Increase social spending to 40% of total spending by 2010; improved access of the poor to medical services through sufficient funding and quality infrastructures + community-based health services; relieving the burden of expenses for health care for the poor; strengthen health mutuals; improve health insurance system to cover all employed labour force and dependents; establish health risk protection system for vulnerable persons; increase health insurance coverage to 50% of population by 2015, compared to 7.8% in 2005. Increased health operating expenditure between 2006-10; Allocate debt cancellation resources to health and other priority sectors. Extend pilot program providing health insurance to uninsured workers in the transport and agricultural sectors, enhance contracting with the private	-	-

							sector for health care (56, 69, 72-76).		
2003-06 (77)	IMF	Poverty Reduction and Growth Facility (PRGF)	24 million (60, 77)	*Details not identified in document(s)*	*Details not identified in document(s)*	High growth; contain inflation; Fiscal deficit contained to 1-4% of GDP; increase wage bill to 29% of revenue, with wage bill ceiling in place; floor on tax revenue; improved tax administration; privatize SONACOS (vegetable oil refining company); rehabilitate SENELEC and ICS (chemical company); improve business environment; simplify private sector regulations; reinforce external competitiveness; trade liberalization; improve public expenditure management and fiscal transparency; contain public investment; cut corporate income tax; improve debt management; enhance bank soundness; improve credit availability (77-79).	Increased health capital expenditure; increased budget allocations to health in 2006 (77-79).	-	-
2002-06 (80)	IMF, WB	Poverty Reduction Strategy Paper (PRSP)-I	Strategy paper	-	-	Main pillars: Wealth creation; capacity building and provision of basic social services; improve living conditions of vulnerable groups; decentralized monitoring and evaluation. Numerous development strategies for different sectors. Also included: Accelerated growth; reduce poverty; fiscal decentralization and improved transparency; expand social protection; target wage bill relative decrease to 27% of revenue; broaden tax base; privatization; reduced corporate income tax from 35 to 33%; some tax exemptions abolished; improve business climate for investments; promote private sector; increase economic productivity; lower energy costs; strengthen debt management capacity; improved public expenditure management, governance, and investment spending efficiency; (80-87).	Access to subsidy for chronically ill health mutual members; Provide infrastructure/ improve equipment at health centres and stations; part of HIPC funds allocated to the health sector; Increase government health spending from 9.2% to 10% of total budget; subsidized care for people living with a disability; enhance access of poorest groups to health services; reducing health expenditures for the poor; access to health mutuals; funding for health care insurance associations, decentralize health budget execution, increase private health service delivery (69, 76, 81, 84, 85)	-	-
2005 (88)	WB	Second Poverty Reduction Support Credit (PRSC)	US$30 million	*Details not identified in document(s)*	Central government administration (50%); Other social services (40%); Sub-national government administration (10%) (89)	Support the implementation of PRSP and strengthen government's capacity to design and carry out its own development and poverty reduction programs; improve effectiveness and transparency of national budget process and expenditure management; promote development of a conducive environment for private investment; improve living conditions of the poor, with focus on delivery of better health services. (88, 89)	*Details not identified in document(s)*	*Details not identified in document(s)*	*Details not identified in document(s)*

2004 (90)	WB	First Poverty Reduction Support Credit (PRSC)	SDR 20.5 million	40 years	Support poverty reduction strategy (90)	Support implementation of poverty reduction strategy. Strengthening budgetary and financial; decentralization; improving financial and human resources management in health sector, accelerating access to basic health (90).	Enhance the role of the private sector in health service delivery. Enhance foreign and local financing to the private health sector. Contracting policy for government to provide coverage for selected private health services. Reducing financial barriers to health service access for poor and vulnerable groups. Developing pooling systems and mitigating effects of cost recovery system on poor and vulnerable groups. Harmonized fee system for drugs and cost recovery. Exemption policy and better management of government subsidies to drugs and other services used by poor, pregnant women and children under 5 years old. Support development of mutual health insurance associations and enabling government to pay premiums for poor and guarantee funds for their sustainability. Increase public health expenditures and pro-poor emphasis (90).	PA: Start decentralizatio n of budgetary execution in Ministry of Health (90).	-
2000-2004 (91)	IMF, WB	Heavily Indebted Poor Countries (HIPC) Initiative	*Debt relief amount: US $850 million (91)*	-	-	HIPC Completion criteria: PRGF and PRSP arrangements in place; privatize 11 public sector enterprises (3/4 reduction of public ownership portfolio); simplify business income taxation; reduce hurdles and “policy distortions” for private sector; liberalization of petroleum sector including oil exploration; reinforce domestic resource mobilization; targets for teacher recruitment and primary education; targets for immunization, prenatal care; primary health centre utilization (91, 92)	-	-	-
2002 (93)	WB	HIV/AIDS Prevention and Control Project	23.6 million (93)	40 years	HIV/AIDS Prevention and Control	Within HIV/AIDS prevention and control: strengthening capacity of executing and implementing agencies and project coordination structures; support to civil society and community based initiatives; support to multi-sector programs of government agencies; support to project management, administration and monitoring (93)	-	-	-

1998-2002 (94)	IMF	Poverty Reduction and Growth Facility (PRGF)	96 million (18)	*Details not identified in document(s)*	*Details not identified in document(s)*	Strengthen public resource management; target fiscal balance of -1% of GDP deficit to 1% surplus; remove impediments to private sector development; privatization of SONACOS; privatization/reform of SENELEC, strengthen oversight with postal service and avert losses; improve public health infrastructure; tax reform; broaden tax base; streamline corporate taxation; strengthen tax and customs administration; improve external competitiveness; floor on tax revenue; contain wage bill within wage bill ceiling; introduction of single-rate VAT; strengthen revenue collection (94-97).	Increase public spending on basic social services; Enhance the pro-poor emphasis of public spending on primary health care (94-96).	-	-
1998-2001 (98, 99)	IMF	Enhanced Structural Adjustment Facility (ESAF), Extended Credit Facility (ECF)	87 million (100)	*Details not identified in document(s)*	*Details not identified in document(s)*	High growth rate; low inflation; restrict external current account deficit; government budget balance between -2 to +2% of GDP; decrease public spending per GDP by one percentage point; improve social indicators; reduce poverty and unemployment; fiscal consolidation; reduce relative share of wage bill with education and health having highest priority for recruitment; strengthen revenue collection via tariff reform and single-rate VAT; broaden tax base, eliminate tax exemptions, reduce import tax; increased capital expenditure; privatization/liquidation of public enterprises; develop the private sector; administrative and judicial reform; sectoral reforms including several health sector targets; debt sustainability; decentralization (98, 99).	Increase social sector spending; increase health expenditure share out of total budget to 9% in 2002; improve access of vulnerable groups to health services; decentralized local government public health cost sharing; revitalize formal sector health insurance (IPMs); creation of Mutual Association Support Unit and formal sector health insurance (IPMs); promotion of community based health insurance; rehabilitate private sector health insurance companies (98, 99).	-	-
1998-2000 (101).	WB	Country Assistance Strategy	Strategy paper	-	-	Reduce poverty; create jobs; high growth rate; “unshackle” and develop private sector; development of social and human resources; broaden VAT base; improved public expenditure management; financial reform; trade liberalization; debt sustainability; reduce size of public sector; improve infrastructure; decentralization; environmental sustainability of growth; ensure social sustainability; several sectoral projects and goals (101).	Increase current budget share allocation to health from 6% in 1996 to 9% in 2002; greater use of beneficiaries and NGOs in the financing of basic health care services (101).	-	-
1995-98 (102)	WB	Country Assistance Strategy	Strategy paper	-	-	Economic growth with equity; poverty reduction; promote competitiveness; trade and price liberalization; sectoral reforms including privatization and liberalization reforms of agricultural sector for increased efficiency and exports, restructuring/privatization of parastatals; improved infrastructure; improve composition of public spending; increased private sector investment; slowing population growth; promoting status of women; natural resource management (102)	Decentralized health cost recovery (102)	-	-

1997 (103)	WB	Endemic Disease Control Project	11 million (103)	40 years	Control endemic and epidemic diseases	Malaria, schistosomiasis and onchocerciasis control; developing and integrating a health management information system; rehabilitation of buildings	-	-	-
1997 (104)	WB	Integrated Health Sector Development Program	36 million (104)	40 years	Health sector development	Constructing/rehabilitating health posts, health centres, tertiary hospitals, social and health-related buildings and centres; provision of equipment for above; information, education, communication, technical advice in public health/health systems (104)	-	-	-
1993 (105, 106)	WB	Macroeconomic update report; Public expenditure review	Economic reports	-	-	Reduce and rationalize public expenditure; increase domestic resource mobilisation by customs and trade tariffs; broaden tax base; become less dependent on external support; privatize/reform parastatals; depreciate real exchange rate to increase external competitiveness and exports; human resources development; several sectoral recommendations (106); Several recommendations for public expenditure reallocation within and between sectors; domestic deflation to improve competitiveness (105)	Protect expenditure on health to ensure minimum efficiency of public services (106); Increase current health expenditure out of total government expenditure from 4.1% in 1989/90 to 6.7% in 1995; develop and establish health insurance; drug cost recovery (105).	-	-
1983-93 (107-109)	IMF, WB	Structural Adjustment Facility (SAF); Enhanced Structural Adjustment Facility (ESAF); Extended Credit Facility (ECF) (including 1985-92 Structural Adjustment Program (SAP))	IMF: 335 million (100)	*Details not identified in document (s)*	*Details not identified in document(s)*	Reduce fiscal deficit; cut government expenditures; credit restraint and interest rate close to or above French levels; liberalization of prices, trade and markets; eliminate subsidies and trade regulations; increase private sector participation in economic activities; reduce public sector's involvement in the economy, promotion of private sector initiative; productive sector investment; improved efficiency of public resource management; reform/privatize/liquidate public enterprises; reduce production costs; widen tax base; improve customs duty collection and reduce tax exemptions; sectoral reforms including financial sector reform; wage bill reductions but with health workers excluded from recruitment ceilings (106-111).	-	-	-
1991 (112)	WB	Human Resources Development Project	25 million (112)	40 years	Control fertility, reduce population growth and restructure health sector (112)	Strengthening of the national family planning program; promotion of the status of women; promotion of youth through family life education; institutional support for the promotion of the national population program; development of the district health system; promotion of essential drugs; institutional strengthening of ministry of health (112)	Restructure the health sector to enable it to provide improved basic health services, including through private sector provision of family planning services (112)	-	-

1987-90 (110)	IMF, WB	Policy Framework Paper (PFP)	Strategy paper	-	-	High growth rate; curb inflation; reduce external current account deficit; promotion of private sector initiative; greater efficiency in public resource management (110).	-		
1984 (111)	WB	Country Economic Memorandum	Economic report	-	-	Improve public finances and public sector management; reduce fiscal deficit; intensify domestic revenue mobilisation; improve tax administration; ; develop growth points; streamline government investment planning; restrain domestic demand; promote exports; improve customs duty administration; fees and user charges for government services; more liberal employment policies for private and public enterprises; openness to foreign trade; reduced government intervention in industry; reduce civil service numbers; improve public debt management; parapublic sector reform; several sectoral recommendations (111).	Careful consideration before embarking on projects to improve or to expand the coverage of public health services, because government cannot expect to finance the recurrent costs of such projects; Introduce user charges for health services; community participation in cost of dispensaries (111).	-	-
1983 (113)	WB	Rural Health Project	14 million (113)	40 years	Health systems strengthening	Constructing and equipping new health centres; renovating and re-equipping existing health centres; training health personnel; improving supply and utilisation of basic drugs; strengthening health education; ministry of health capacity building; nutrition (113)	-	-	-
1979-85 (111, 114)	IMF, WB	Medium-Term Plan for Economic and Financial Recovery (Structural Adjustment Program (SAP)-1); IMF Stand-By Arrangement (SBA); IMF Extended Fund Facility (EFF); WB Structural Adjustment Loan (SAL)	EFF: 185 million (partly cancelled); SBA: 126 million; SAL: 53 million (115)	*Details not identified in document (s)*	Support medium-term adjustment program (115)	Reform of the parapublic sector; reform of agricultural policies; expand rural production; improved production incentives; economic stabilization; raise public savings through austere fiscal policies; reduce external current account deficit; reduce fiscal deficit to 4.8% of GDP; limited and selective growth of investments focusing on productive sectors; improve monetary policies; credit restriction; improve balance of payments; encourage exports; improve foreign debt management; liberate prices; liberalise trade; limit wage growth; reduce subsidies; reduce state participation in the economy (111, 115, 116).	-	-	-
1979 (117)	WB	The Economic Trends and	Economic report	-	-	Eliminate housing subsidies for established workers; public investment in slum upgrading, land preparation and basic collective facilities; increase pricing of public services; population policy; higher economic growth rate; Several	-	-	-

		Prospects of Senegal				sectoral recommendations; continue promotion of rainfed agriculture; accelerate irrigation; develop a labour-intensive, export-oriented industry in Dakar; currency devaluation; export subsidies; restrict commercial borrowing (117)			
1973 (118, 119)	WB	Senegal - The economy	Economic report	-	-	Rationalise public investment; improved public financial management and planning; build ministerial human resource capacity (118); agricultural diversification; develop water resources; expand fishery and manufacturing; several other sectoral recommendations; stimulate exports; improve import competition; promote local enterprise; reduce unemployment; grow and diversify economy; invest in productive sectors (119)	Increase government expenditures for materials and supplies in health sector (119); faster increase in health sector investment allocations (119)	-	-
1970 (120)	WB	Senegal - The current economic situation and prospects of Senegal	Economic report	-	-	Increase economic competitiveness; diversify production; develop industrial exports; several sectoral recommendations (120)	-	-	-
1968 (121)	WB	Current economic position and prospects of Senegal	Economic report	-	-	-	-	-	-
1966 (122)	WB	The Economy of Senegal	Economic report	-	-	-	-	-	-

*Table 10.4: Overview of IMF and World Bank instruments and arrangements in Senegal. Main policy content in associated documents, including policy recommendations, targets, objectives and loan conditionalities directly relevant to domestic health financing sources, were extracted. *One Special Drawing Rights (SDR) has historically been worth approximately 1.3-1.5 US$, depending on the daily exchange rate (123). We have only included IMF disbursements made specifically under the listed arrangements/instruments, not the running smaller charges on Senegal's General Resource Account (GRA). Similarly, WB documents include major development policy and loan agreements, and not smaller project financing agreements. IT: Indicative Target. PA: Prior Action.*

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